

SHEET INDEX

[illegible][illegible]

SHEET INDEX NOTES

1. WHEN CHANGES ARE MADE IN THIS DRAWING, ONLY THOSE SHEETS AFFECTED WILL BE REISSUED.
2. THIS SHEET INDEX WILL BE REISSUED AND BROUGHT UP TO DATE EACH TIME ANY SHEET OF THE DRAWING IS REISSUED, OR A NEW SHEET IS ADDED.
3. THE ISSUE NUMBER ASSIGNED TO A CHANGED OR NEW SHEET WILL BE THE SAME ISSUE NUMBER AS THAT OF THE SHEET INDEX.
4. SHEETS THAT ARE NOT CHANGED WILL RETAIN THEIR EXISTING ISSUE NUMBER.
5. THE LAST ISSUE NUMBER OF THE SHEET INDEX IS RECOGNIZED AS THE LATEST ISSUE NUMBER OF THE DRAWING AS A WHOLE.

SUPPORTING INFORMATION

	CATEGORY	NO.
T	EQUIPMENT DRAWING	J-94055a-()
	EQUIPMENT DESIGN REQ	J-94055 (BDI-250-174)
	DESCRIPTION AND OPERATION	233-135-110
	TEST SPECIFICATION	X-79411
	STORED PROGRAM INFORMATION	
	SPC MINI-ROTL FQZ NO. 3 ESS:	
	DIAGNOSTIC PROGRAM	PR-350945
	RUNNING PROGRAM	PR-350946

NOTICE
NOT FOR USE OR
DISCLOSURE OUTSIDE
THE BILL SYSTEM
EXCEPT UNDER
WRITTEN AGREEMENT

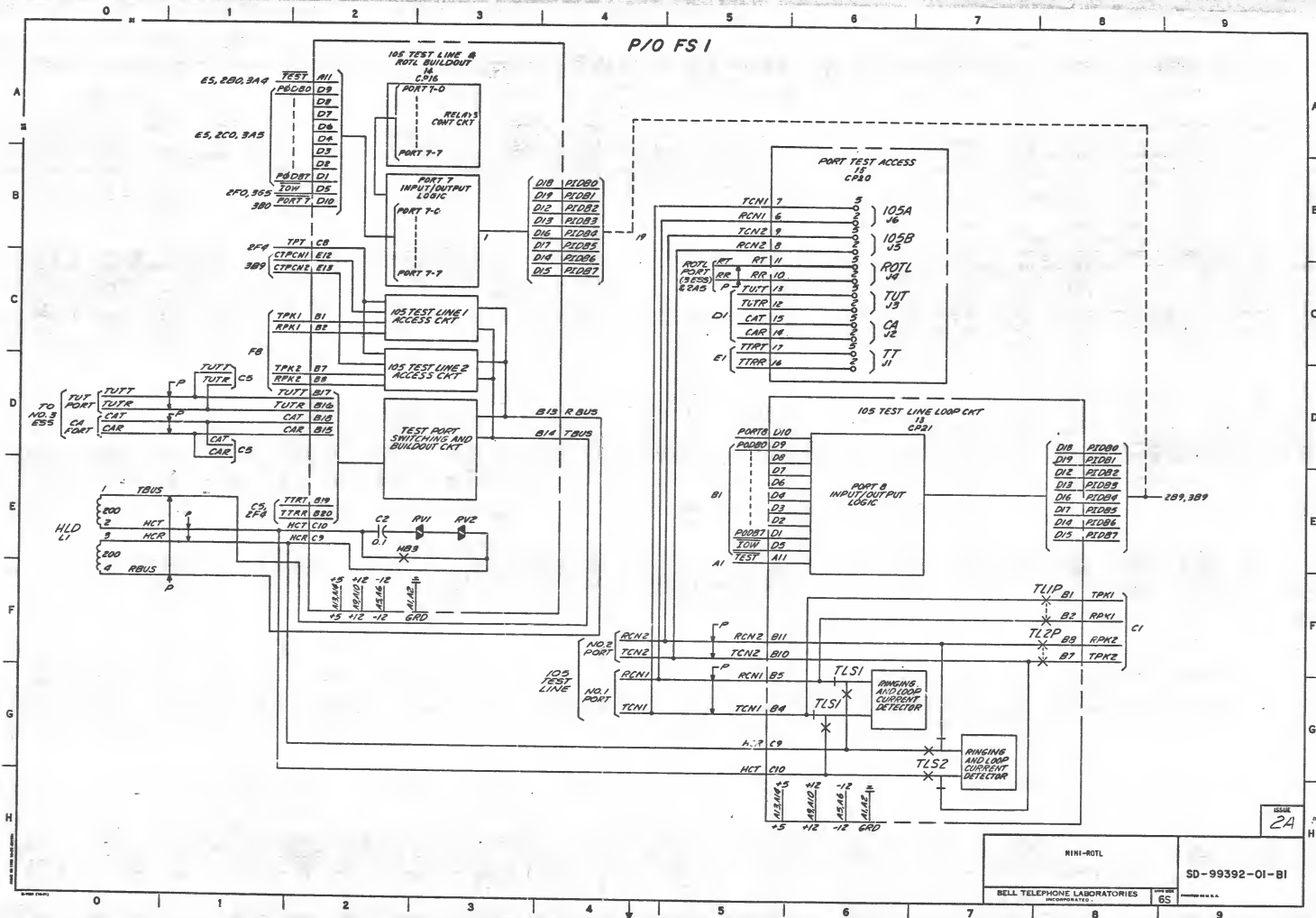
ISSUE
4A

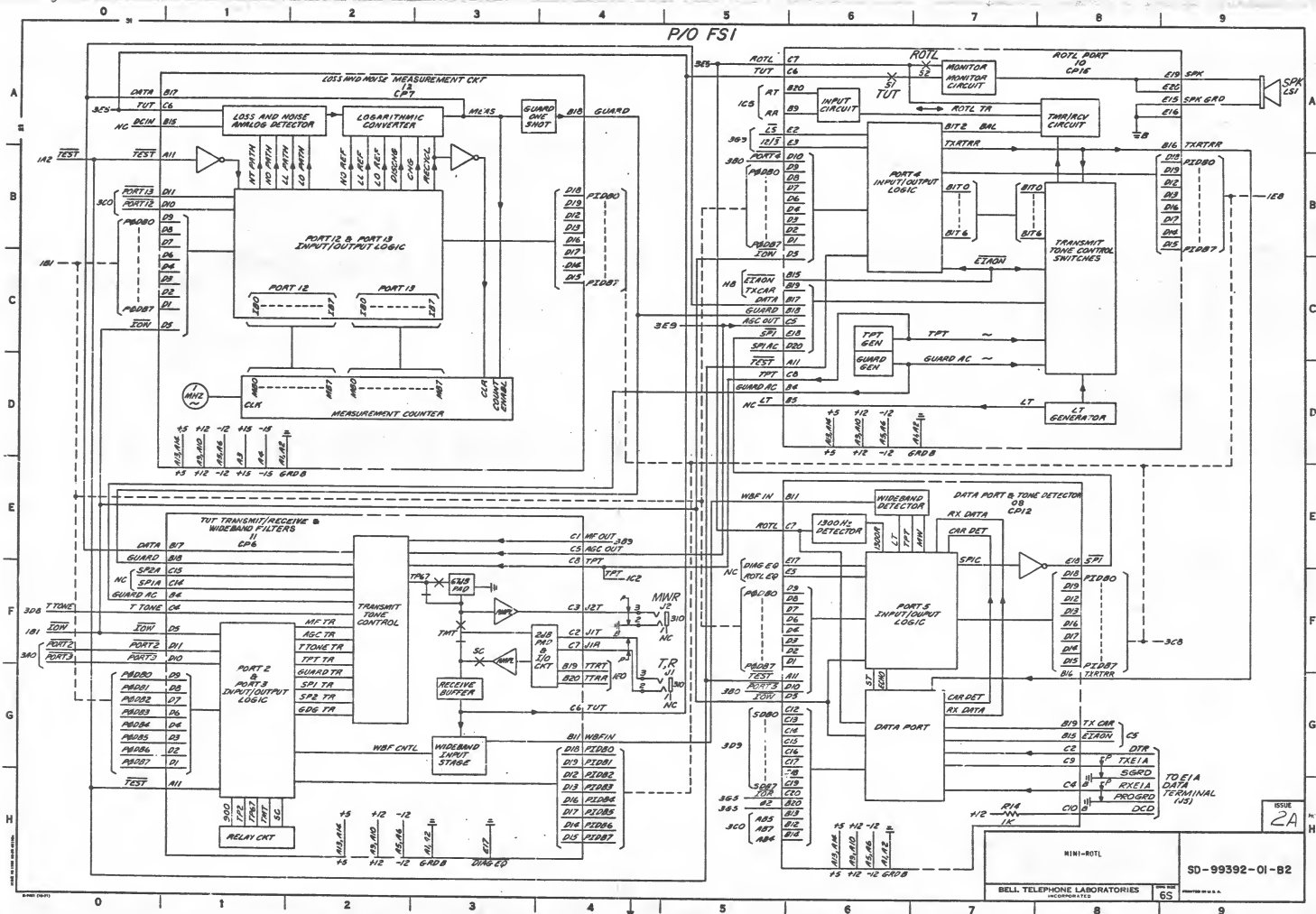
AT&T
STANDARD

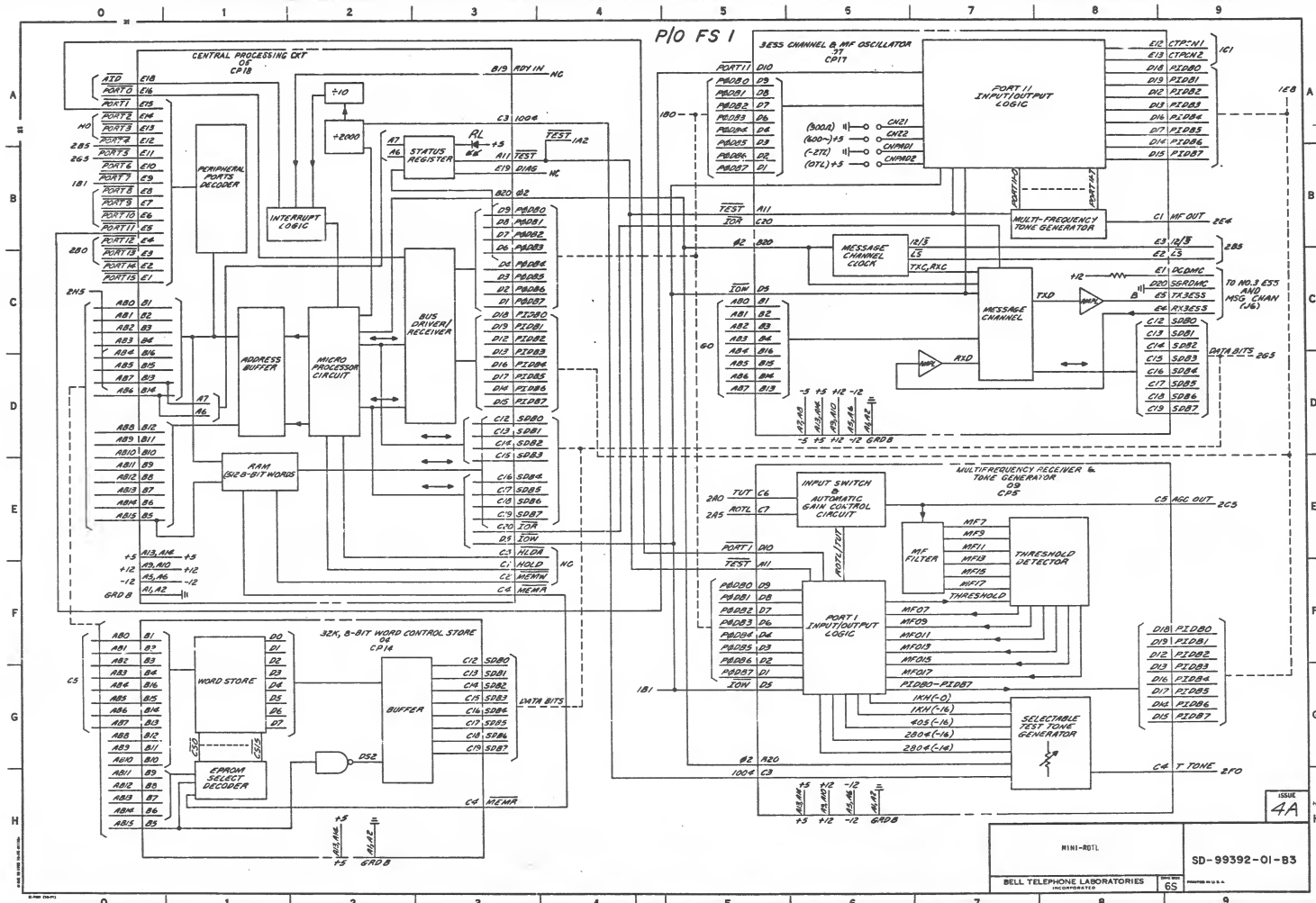
COMMON SYSTEMS
TRANSMISSION MEASURING
MINI-ROTL CIRCUIT
FOR USE WITH
TOOL PROGRAM CONTROL OF

BELL TELEPHONE LABORATORIES
INCORPORATEDSD-99392-01-A1
82 SHEETS

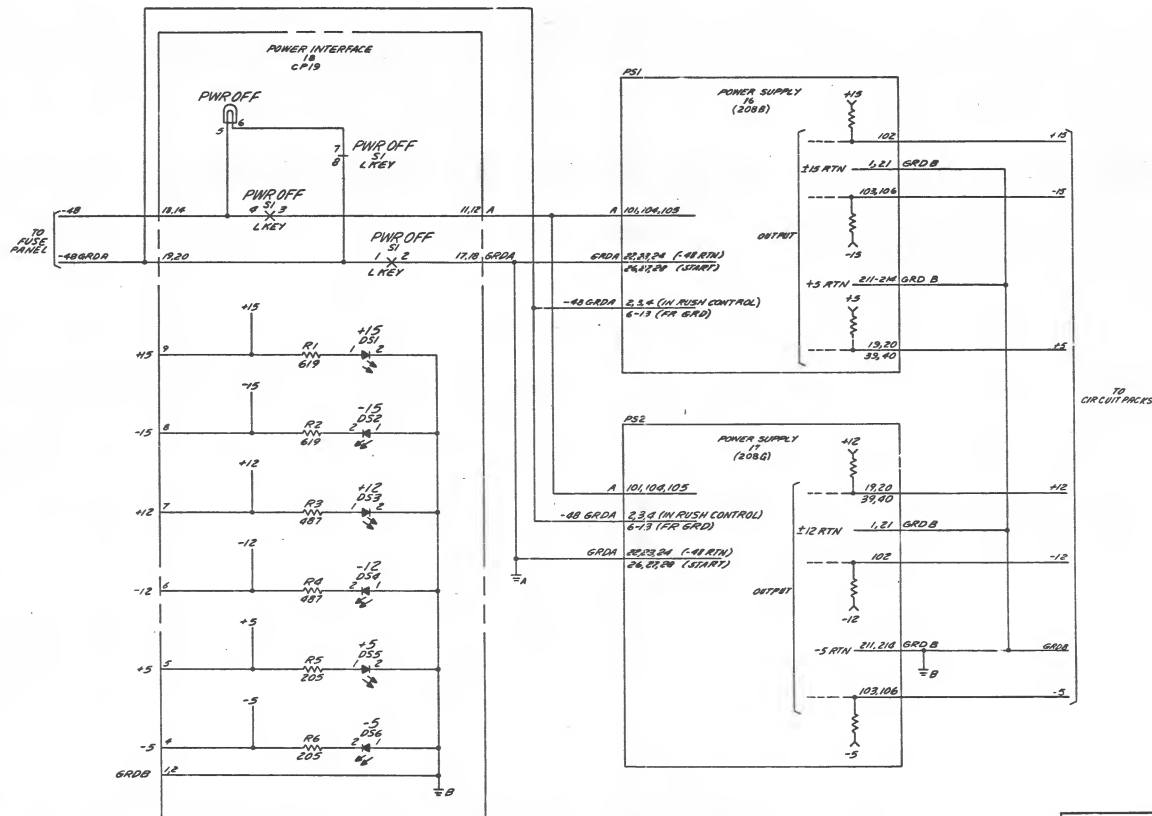
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P/O FS I



APP FIG. 1

CIRCUIT PACKS

EQUIP LOC	9	11	12	8	4	10	14	7	5	18	15	13		
DESIG	CP5	CP6	CP7	CP12	CP14	CP15	CP16	CP17	CP18	CP19	CP20	CP21		
CODE	ED-30117-()	ED-30118-()	ED-30119-()	ED-30131-()	ED-30399-()	ED-30391-()	ED-30392-()	ED-30393-()	ED-30140-()	ED-30394-()	ED-30396-()	ED-30394-()		
OPTION														
ELEM IDENT														
FS LOC	3E7	2E1	2A2	2E7	3F2	2A7	1A3	3A6	3E2	4A1	1B6	1D6		

CONNECTOR

FUNC DESIG	REF DESIG	FS LOC	CODE
E1A	J5	100	KS-14087,L2
RCS CHAN	J6	100	KS-14087,L2

INDUCTOR

FUNC DESIG	REF DESIG	FS LOC	CODE
HLD	L1	1E0	274L

JACK

FUNC DESIG	REF DESIG	FS LOC	CODE
T,R	J1	1F0	238M
MUR	J2		238H

POWER UNIT

FUNC DESIG	EQUIP LOC	FS LOC	CODE
PS1	16	4B4	208B
PS2	17	4E4	208B

SPEAKER, LOUD

FUNC DESIG	REF DESIG	FS LOC	CODE
SPK	LS1	2A9	761A

MINI-PORTL

DWG SIZE
65ISSUE
2A

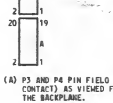
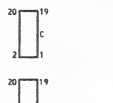
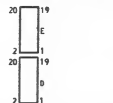
BELL LABORATORIES

SD-99392-01

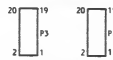
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EQUIPMENT NOTES:

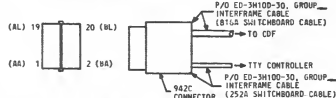
201. UNLESS OTHERWISE SPECIFIED, ALL WIRING SHALL BE AS FOLLOWS:
BATTERY AND GND WIRING, 15-19194, L1, 20 GAUGE SOLID.
MISCELLANEOUS WIRING, TYPE 2807 SOLID.
202. TYPICAL 10-TYPE CONTACT PIN FIELD CONFIGURATION FOR A GROUP OF FIVE 70-30-20 CONNECTORS AS VIEWED FROM THE WIRING SIDE OF THE 842180-447 BACKPLANE ASSEMBLY.



203. (A) P3 AND P4 PIN FIELD CONFIGURATIONS (10-TYPE CONTACT) AS VIEWED FROM THE WIRING SIDE OF THE BACKPLANE.



- (B) PART OF ED-30100-30, GROUP- INTERFRAME CABLE SHOWING THE TWO SWITCHBOARD CABLES AND THE 70-30-20 CONNECTOR CONFIGURATION FOR INTERFACING WITH THE P4 PIN FIELD ON THE BACKPLANE OF THE SPC MINI-ROTL UNIT (SEE NOTE 204).



204. THE SPC MINI-ROTL UNIT IS MOUNTED IN A MISCELLANEOUS-TYPE FRAME IN THE NO.3 ESS OFFICE. THIS UNIT INTERFACES DIRECTLY WITH BOTH THE 22510-30 DISTRIBUTING FRAME (CDF) AND THE NO.3 ESS TTY CONTROLLER (MAINTENANCE FRAME). THE INTERFACE WIRING REQUIRES THE ED-30100-30, GROUP- INTERFRAME CABLE. THIS INTERFRAME CABLE IS NOT INCLUDED AS PART OF THE SPC MINI-ROTL UNIT AND MUST BE ORDERED AS A SEPARATE ITEM. IT CONSISTS OF TWO SEPARATE SWITCHBOARD CABLES CONNECTED TO A 70-30-20 CONNECTOR (SEE NOTE 203, PART B). THE 87A SWITCHBOARD CABLE (A PAIR) IS REQUIRED FOR INTERFACING WITH THE COMBINED DISTRIBUTING FRAME. THIS CABLE SHALL BE OPEN ENDED AT THE CDF END. IT IS AVAILABLE IN SIX DIFFERENT LENGTHS: FOR ED-30100-30, GROUP-A, THE CABLE IS 66 FEET LONG - THE STANDARD LENGTH; THE OTHER FIVE LENGTHS ARE: GROUP-B, 70 FEET; GROUP-C, 86 FEET; GROUP-D, 96 FEET; GROUP-E, 106 FEET; AND GROUP-F, 116 FEET. THE 252A SWITCHBOARD CABLE (A PAIR) IS REQUIRED FOR INTERFACING WITH THE NO.3 ESS TTY CONTROLLER. THIS CABLE MUST HAVE A RS-1907-L2 CONNECTOR AT THE TTY CONTROLLER END. FOR DEDICATED-TYPE TTY CONTROLLERS THIS CABLE IS A PREDETERMINED LENGTH. FOR NONDEDICATED-TYPE TTY CONTROLLERS THE LENGTH OF THIS CABLE HAS TO BE DETERMINED FOR ORDERING PURPOSES.

EQUIPMENT NOTES: (CONT)

205. THE INTERCONNECTION WIRING INFORMATION FOR THE SPC MINI-ROTL UNIT SHALL BE IN ACCORDANCE WITH THE FOLLOWING NO.3 ESS OFFICE REQUIREMENTS. THESE ARRANGEMENTS REPRESENT THE WIRING CONNECTIONS AT THE COMBINED DISTRIBUTING FRAME (CDF) AND THE TTY CONTROLLER IN THE NO.3 ESS OFFICE (SEE CMO 1).

EXISTING NO.3 ESS OFFICE EQUIPPED WITH THE 105-TYPE TEST LINE FEATURE ONLY.

THE INTERFACE WIRING SHALL ONLY CONSIST OF THE FOUR CONNECTIONS FROM THE TWO, 105-TYPE, TEST LINE PORTS OF THE SPC MINI-ROTL UNIT TO THE NO.3 ESS, 105-TYPE TEST SUBSCRIBER LINE APPEARANCES.

EXISTING NO.3 ESS OFFICE EQUIPPED WITH THE 105-TYPE TEST LINE FEATURE AND UPGRADED TO INCLUDE THE ROTL FEATURE (NO.3 ESS, 303 GENERIC).

THE INTERFACE WIRING SHALL CONSIST OF THE THREE PAIRS OF PORT LEAD CONNECTIONS (ROT, TUT, A C3) AND THE FOUR MESSAGE CHANNEL CONNECTIONS OF THE SPC MINI-ROTL UNIT TO THE NO.3 ESS ROTL NETWORK APPEARANCES AND THE TTY CONTROLLER, RESPECTIVELY. IN ADDITION TO THE FOUR 105-TYPE TEST LINE PORT CONNECTIONS.

NEW NO.3 ESS OFFICE EQUIPPED WITH THE 303 GENERIC:

THE INTERFACE WIRING SHALL CONSIST OF ALL FOURTEEN (14) CONNECTIONS OF THE INTERFRAME CABLE FROM THE SPC MINI-ROTL UNIT REQUIRED TO IMPLEMENT THE COMBINED ROTL AND 105-TYPE TERMINATING TEST LINE FEATURES IN THE NO.3 ESS OFFICE.

206. A COMPLETE SET OF SPC MINI-ROTL SPARE CIRCUIT PACKS (INCLUDING THE 208-TYPE POWER UNITS) SHALL BE ORDERED AS FOLLOWS:

J94055A, LIST 2 SPARE CIRCUIT PACKS

207. THE ED-5513A-30 EXTENDER BOARD ASSEMBLY SHALL BE USED AS THE PLUG-IN EXTENDER CARD FOR BOTH SPC MINI-ROTL MAINTENANCE AND TROUBLE-SHOOTING PROCEDURES.

EQUIPMENT NOTES: (CONT)

208.

LEAD DESIGNATIONS FOR PINS ON 9270 CONNECTOR				
CONNECTOR PIN NO.	ED-2C555-() CP19	2086 P52	2088 P51	ED-2C554-() CP20
216	208			
215				
207				
214	208	GRD0	GRD0	
213	208	GRD0	GRD0	
206				
212	208	GRD0	GRD0	
204				
211	208	GRD0	GRD0	
203				
210	202			
209				
201				
40	20	-48 GRD4	+12V	+5V
39			+12V	+5V
19	-48 GRD4	+12V	+5V	+5V
38				
18	GRD4			
17	GRD4			TTT
16				TTT0
15				CAT
14				CAR
13				
12		-48 GRD4	-48 GRD4	TUT1
11	A	-48 GRD4	-48 GRD4	TUTR
10	A	-48 GRD4	-48 GRD4	RT
9		-48 GRD4	-48 GRD4	RR
8	+15V	-48 GRD4	-48 GRD4	TCW2
7	GRD4	GRD4		
6	-15	-48 GRD4	-48 GRD4	RCW2
5		GRD4	GRD4	
4	+12V	-48 GRD4	-48 GRD4	TCW1
3	GRD4	GRD4		
2	-12V	-48 GRD4	-48 GRD4	RCW1
1				
106				
105				
104				
103				
102				
101				

4 PINS ARE ASSIGNED FOR FUTURE USE.

LEAD DESIGNATIONS FOR 10-TYPE (1-40274-53) PINS ON 842180-447 BACKPLANE ASSEMBLY			
CONNECTOR PIN NO.	P3	P4	
20	DTR		
19	SP		
18	SGRDMC	REMI	
17	SPASRD	TCM1	
16	J1T	RCW2	
15	GRD0	TCW2	
14	J1R	J1R	
13	J2T	HT	
12	MC1	TUTR	
11	MCB	J2T	
10	TRUS	CAT	
9	RRUS	CAR	
8	DCD	DCMD	
7	SGRD	SGRDMC	
6	DCOM		
5	TX3555		
4	TX3555		
3	TX3555		
2	TX3555		
1	TX3555		

MINI-ROTL		DWG. SIZE AS	ISSUE 4A
BELL LABORATORIES		SD-99392-01	-D2

PINS ARE ASSIGNED FOR FUTURE USE.

MINI-ROTL			
		DWG. SIZE AS	ISSUE 2A
BELL LABORATORIES	SD-99392-01	-D3	

INFORMATION NOTES:

301. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS.
K IS FOR KILOHMS AND MICROHMS.
CAPACITANCE VALUES ARE IN MICROFARADS.
INDUCTANCE VALUES ARE IN HENRIES.
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.

302. CONNECTING INFORMATION

SYSTEM		
NO. 3 ESS	NETWORK FRAME CKT J-30001B	DRAWING NO. SD-31901-01
	TELETYPEWRITER CONTROLLER UNIT J-1C054A	SD-1C005-01

INFORMATION NOTES: (CONT)

303. THE FOLLOWING TABLE INDICATES THE BIT ASSIGNMENTS FOR THE INPUT/OUTPUT FUNCTION.

LOCATED ON CP	PORT NUMBER	PORT ADDRESS	BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION				
CP5	01H		#000	AGT1/TUT	CONNECTS AGC INPUT TOWARD CONTROLLING LOCATION OR TRUNK UNDER TEST				
			#001	THRESHOLD	CHANGES THRESHOLD LEVEL OF RF RECEIVER TO DETECT 2/4 CODE				
			#002	1KX(0)	CAUSES TEST TONE GENERATOR TO OUTPUT A 1KHZ SIGNAL AT 0dB				
			#003	1KH(-16)	CAUSES TEST TONE GENERATOR TO OUTPUT A 1KHZ SIGNAL AT -16dB				
			#004	-	SPARE				
			#005	405(-16)	CAUSES TEST TONE GENERATOR TO OUTPUT A 405HZ SIGNAL AT -16dB				
			#006	2804(-16)	CAUSES TEST TONE GENERATOR TO OUTPUT A 2804HZ SIGNAL AT -16dB				
			#007	2804(-16)	CAUSES TEST TONE GENERATOR TO OUTPUT A 2804HZ SIGNAL AT -16dB				
			BIT INPUT TO CPU FROM PORT						
			1000	RF07	<table><tr><td>700HZ</td></tr><tr><td>900HZ</td></tr><tr><td>1100HZ</td></tr><tr><td>1300HZ</td></tr><tr><td>1500HZ</td></tr><tr><td>1700HZ</td></tr></table>	700HZ	900HZ	1100HZ	1300HZ
700HZ									
900HZ									
1100HZ									
1300HZ									
1500HZ									
1700HZ									
1001	RF09								
1002	RF11								
1003	RF13								
1004	RF15								
1005	RF17								
1006	-		SPARE						
1007	-								
2		BIT OUTPUT FROM CPU TO PORT							
		#000	RFTR	CONNECTS OUTPUT OF RF GENERATOR TO TUT					
		#001	ASCR	CONNECTS OUTPUT OF AGC TO TUT					
		#002	TIDNETR	CONNECTS OUTPUT OF TEST TONE GENERATOR TO TUT					
		#003	TP1TR	ASSERTED HIGH APPLIES CPT (USED AS DATA TONE) TO TUT					
		#004	GUARDTR	APPLIES BOARD TONE TO TUT					
		#005	WPCNTL	CONNECTS WIDEAREA TONE DETECTOR TO TUT					
		#006	SP1TR	SPARE TONE SWITCH CONTROL					
		#007	SP2TR	SPARE TONE SWITCH CONTROL					
		BIT INPUT TO CPU FROM PORT							
		1000							
		1001							
		1002							
		1003							
		1004		SPARE					
		1005							
		1006							
		1007							
CP6		BIT OUTPUT FROM CPU TO PORT							
		#000	GD0TR	ALLOWS GUARD AND DATA TONE TO BE SENT OVER TUT					
		#001	TP67	ASSERTED HIGH INSERTS 67 dB PAD					
		#002	TNT	TRANSMIT TONES; ASSERTED LOW = RECEIVE TONES					
		#003	TP2	TRANSMIT AT -20dB; ASSERTED LOW - TRANSMIT AT 0dB					
		#004	-	SPARE					
		#005	ZW00	ASSERTED HIGH FOR TESTING 900 OHM TRUNKS; ASSERTED LOW FOR 600 OHM TRUNKS					
		#006	-	SPARE					
		#007	SC	ASSERTED HIGH FOR SELF CHECK CALIBRATION TEST					
		BIT INPUT TO CPU FROM PORT							
		1100							
		1001		SPARE					
		1012							
		1013							
		1014	DATA	ASSERTED HIGH WHEN CP7 IS CAUSING DATA TONE TO BE SENT					
		1015	GUARD	ASSERTED HIGH WHEN CP7 IS CAUSING GUARD TONE TO BE SENT					
		1016							
		1017		SPARE					

MINI-ROT

DWG. SIZE
ASISSUE
2A

BELL LABORATORIES

SD-99392-01

-D4

INFORMATION NOTES (CONT):

303.(CONT)

LOCATED ON CP	PORT NUMBER	PORT ADDRESS	BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION
12	DCH		#B00	RECVEL	ASSERTED HIGH = INITIALIZES THE MEASUREMENT CIRCITS
			#B01	-	SPARE
			#B02	CHG	ALLOWS SIGNAL TO BE MEASURED TO CHARGE MEAS CAP.
			#B03	DISCHG	CONNECTS CHARGED MEAS CAP. TO TIMING RESISTOR
			#B04	NT PATH	NOISE WITH TONE MEASUREMENT
			#B05	HD PATH	NOISE MEASUREMENT
			#B06	LL PATH	L. LOW LEVEL MEASUREMENT
			#B07	LD PATH	LOSS MEASUREMENT
			BIT INPUT TO CPU FROM PORT		
			#B08		
			#B09		
			#B10		
			#B11		
			#B12		
CP7			#B13		
			#B14		
			#B15		
			BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION
			#B00	-	SPARE
			#B01	-	SPARE
			#B02	-	SPARE
			#B03	-	SPARE
			#B04	-	SPARE
			#B05	-	SPARE
			#B06	-	SPARE
			#B07	-	SPARE
			#B08	-	SPARE
			#B09	-	SPARE
13	DCH		#B05	NO REF	NOISE MEASUREMENTS
			#B06	LL REF	LOW LEVEL MEASUREMENTS
			#B07	LD REF	LOSS MEASUREMENTS
			BIT INPUT TO CPU FROM PORT		
			#B10		
			#B11		
			#B12		
			#B13		
			#B14		
			#B15		
			#B16		
			#B17		
			#B18		
			#B19		
			BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION
			#B00	-	SPARE
			#B01	SPIC	SPARE
			#B02	-	SPARE
			#B03	-	SPARE
			#B04	-	SPARE
			#B05	ST	ASSERTED HIGH PLACES MODEM INTO SELF TEST MODE
			#B06	ECHO	CAUSES MODEM TO TRANSMIT ECHO SUPPRESSOR DISABLING TIME (2100MS)
			#B07	-	SPARE
			BIT INPUT TO CPU FROM PORT		
			#B10		
			#B11		
			#B12		
			#B13		
CP12	5	DSH	#B14		
			#B15		
			BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION
			#B00	-	SPARE
			#B01	SPIC	SPARE
			#B02	-	SPARE
			#B03	-	SPARE
			#B04	-	SPARE
			#B05	ST	ASSERTED HIGH PLACES MODEM INTO SELF TEST MODE
			#B06	ECHO	CAUSES MODEM TO TRANSMIT ECHO SUPPRESSOR DISABLING TIME (2100MS)
			#B07	-	SPARE
			BIT INPUT TO CPU FROM PORT		
			#B10		
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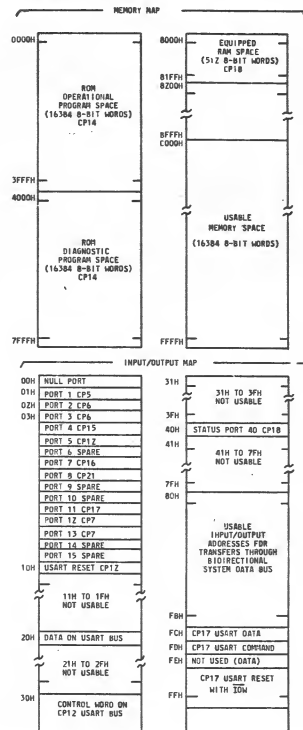
INFORMATION NOTES: (CONT)

303. (CONT)

LOCATED ON CP	PORT NUMBER	PORT ADDRESS	BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION
CP17	11	DBH	BIT INPUT TO CPU FROM PWR	BIT DESIG	BIT FUNCTION
			TRD0	CNPAD 1	HIGH = 0.05 TEST LEVEL; LOW = ~20% TEST LEVEL ON 105A (1)
			TRD1	CNPAD 2	HIGH = 0.05 TEST LEVEL; LOW = ~20% TEST LEVEL ON 105B (2)
			TRD2	CHZ 1	HIGH = 800 OHM TEST 2; LOW = 900 OHM TEST 2 ON 105A (1)
			TRD3	CHZ 2	HIGH = 800 OHM TEST 2; LOW = 900 OHM TEST 2 ON 105B (2)
			TRD4		
			TRD5		
			TRD6		
			TRD7		
			BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION
			TRD0	TEST	ASSERTED LOW TO TEST I/O PORT LATCHES AND STEERING LOGIC
			TRD1	DIAG	NOT IMPLEMENTED
			TRD2	-	SPARE
			TRD3	RUN	ASSERTED LOW TO LIGHT SYSTEM RUN LED IN OPERATIONAL MODE
			TRD4		
			TRD5		
			TRD6		
			TRD7		
CP18A	0	40H	BIT INPUT TO CPU FROM PWR	BIT DESIG	BIT FUNCTION
			TRD0		
			TRD1		
			TRD2		
			TRD3		
			TRD4		
			TRD5		
			TRD6		
			TRD7		
			BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION
			TRD0	TEST	ASSERTED LOW TO TEST I/O PORT LATCHES AND STEERING LOGIC
			TRD1	DIAG	NOT IMPLEMENTED
			TRD2	-	SPARE
			TRD3	RUN	ASSERTED LOW TO LIGHT SYSTEM RUN LED IN OPERATIONAL MODE
			TRD4		
			TRD5		
			TRD6		
			TRD7		
CP21	8	DBH	BIT INPUT TO CPU FROM PWR	BIT DESIG	BIT FUNCTION
			TRD0	TLS 1	TRANS/RES 105A (1) SUPERVISION VIA HOLD COIL
			TRD1	TLS 2	TRANSFERS 105B (2) SUPERVISION VIA HOLD COIL
			TRD2	TLOW	CONNECTS 105A (1) TO TEST LINE INPUT PORT 1
			TRD3	TLOW	CONNECTS 105B (2) TO TEST LINE INPUT PORT 2
			TRD4	TLP	CAUSES 105A (1) LOOP TO GO ON HOLD
			TRD5	TLP	CAUSES 105B (2) LOOP TO GO ON HOLD
			TRD6	-	
			TRD7	-	
			BIT OUTPUT FROM CPU TO PORT	BIT DESIG	BIT FUNCTION
			TRD0	TLLC1	HIGH = 105A (1) LOOP CURRENT IS PRESENT
			TRD1	TLLC2	HIGH = 105B (2) LOOP CURRENT IS PRESENT
			TRD2		
			TRD3		
			TRD4		
			TRD5		
			TRD6		
			TRD7		

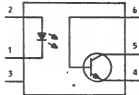
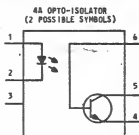
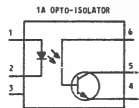
INFORMATION NOTES: (CONT)

304. THE FOLLOWING MAPS INDICATE THE MEMORY AND I/O ASSIGNMENTS OF THE MINI-ROTL SYSTEM.



INFORMATION NOTES (CONT):

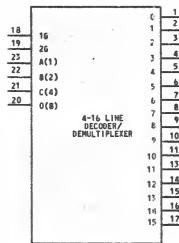
305. INTEGRATED CIRCUIT UNIT SYMBOLOGY IS AS FOLLOWS:



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

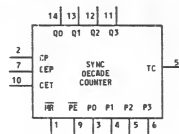
129A DECODER/DEMULTIPLEXER, 4-16 LINE PP
TTL (NAND, OR)
129A JEDEC



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

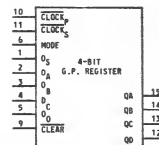
41CH SYNCHRONOUS DECADE COUNTER
WITH ASYNCHRONOUS CLEAR
TTL 5.0V
41CH JEDEC



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

41CF 4-BIT GENERAL PURPOSE REGISTER
(NEGATIVE EDGE TRIGGERED SHIFT REGISTER)
TTL (NAND, OR)
41CF JEDEC



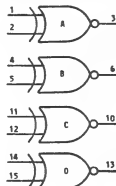
INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

MINI-ROT		DWG SIZE	ISSUE
		6S	/
BELL LABORATORIES	SD-99392-01	-D7	

INFORMATION NOTES: (CONT)
305.

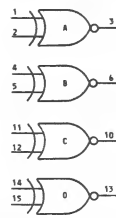
41CS QUAD EXCLUSIVE NOR GATE
TTL (L) 5.0V
41CS MEQ.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

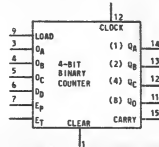
41CT QUAD EXCLUSIVE NOR GATE
WITH OPEN COLLECTOR OUTPUTS
TTL (L) 5.0V
41CT MEQ.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

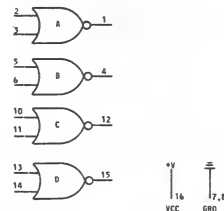
41OT SYNCHRONOUS BINARY COUNTER
WITH ASYNCHRONOUS CLEAR
TTL (M) 5.0V
41OT MEQ.



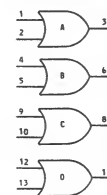
INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

41EE QUAD 2-INPUT NOR GATE
TTL (L) 5.0V
41EE MEQ.



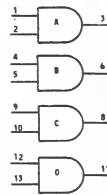
74L53B K5-21736, L13
2-INPUT POSITIVE OR GATES.
SN74L53B, TEXAS INSTRUMENT, OR EQUIVALENT.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

74L98B K5-21736, L35
LOW POWER SCHOTTKY QUAD
2-INPUT POSITIVE NAND GATES
SN74L98B, TEXAS INSTRUMENT, OR EQUIVALENT.



INPUT/OUTPUT INFORMATION

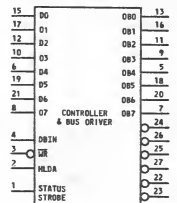
CIRCUIT DESCRIPTION

MINI-ROTL		ONE SIZE	ISSUE
		h5	3B
BELL LABORATORIES	SD-99392-OI	-D8	

INFORMATION NOTES: (CONT)

305.

0220 KS-21750, L1
SCHOTTKY BIPOLAR SYSTEM CONTROLLER
AND BUS DRIVER
TMS0220 INTEL CORP
SHVLS020 TEXAS INSTRUMENTS OR EQUIV.

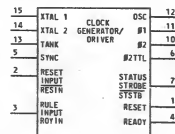


INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

THIS IS A COMPLEX DEVICE. ANY EXPLANATORY
DATA SHOULD BE OBTAINED FROM MANUFACTURERS.

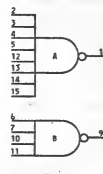
0224 KS-21757, L1
SCHOTTKY BIPOLAR CLOCK GENERATOR AND
DRIVER FOR 8080 CPU
TMS0224 INTEL CORP
SHVLS024 TEXAS INSTRUMENTS OR EQUIV.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

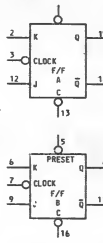
41WA 74AL 8-4 NAND GATE
4148 MECO.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

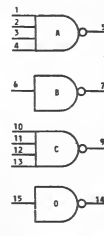
41AB J-K FLIP FLOP
4148 MECO.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

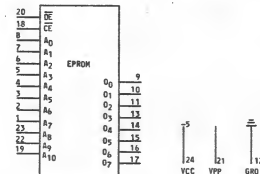
41W 0080 1-1-4-4 NAND GATE
4148 MECO.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

0716 KS-2260, L1
16K (2Kx8) UV ERASABLE PROM
2716 INTEL CORPORATION.



INPUT/OUTPUT INFORMATION

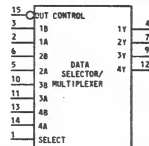
CIRCUIT DESCRIPTION

MINI-ROTL		DWG. SIZE 65	ISSUE 3B
BELL LABORATORIES	SD-99392-CI	-D9	

INFORMATION NOTES: (CONT)

305.

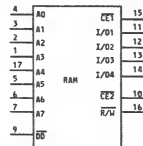
74LS257 KS-21285,L6
2-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
SN74LS257N, TEXAS INSTRUMENT OR EQUIV.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

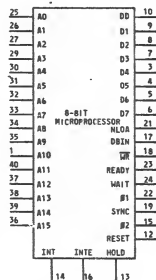
4042-2 256-WORD BY 8-BIT STATIC RANDOM
ACCESS MEMORIES.
TMS4042-2 TEXAS INSTRUMENT OR EQUIV.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

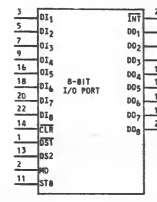
8080 KS-21842,L1
8-BIT MICROPROCESSOR,
THE 8080, INTEL CORP.
TEXAS INSTRUMENT OR EQUIV.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION
THIS IS A COMPLEX DEVICE. ANY EXPLANATORY DATA
SHOULD BE OBTAINED FROM MANUFACTURERS
DATA SHEETS.

8212 KS-21754,L1
8-BIT INPUT/OUTPUT PORT
8212, INTEL CORP.
TIN 8212 TEXAS INSTRUMENT OR EQUIV.



INPUT/OUTPUT INFORMATION

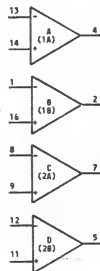
CIRCUIT DESCRIPTION
THIS IS A COMPLEX DEVICE. ANY EXPLANATORY
DATA SHOULD BE OBTAINED FROM MANUFACTURERS
DATA SHEETS.

MINI-ROTL		DWG SIZE A2	ISSUE 38
BELL LABORATORIES		SD-99392-OI	-DIO

INFORMATION NOTES: (CONT)

305.

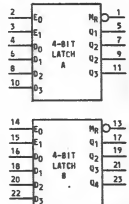
559C DUAL OPERATIONAL AMPLIFIER
559C NEED.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

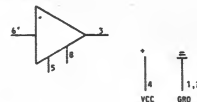
93L00 15-27284 L1
33AL 4-BIT LATCH
93L00C, FAIRCHILD.



INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

1300 15-22141 L1
AUDIO AMPLIFIER
1300P, MOTOROLA.



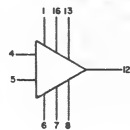
INPUT/OUTPUT INFORMATION

CIRCUIT DESCRIPTION

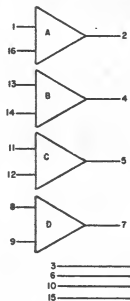
MINI-ROT		DWG. SIZE	ISSUE
		45	3E
BELL LABORATORIES	SD-99392-01		-D11

INFORMATION NOTES (CONT.):
305.

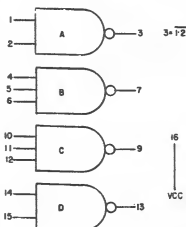
5023 VOICE FREQUENCY
DC AND VOICE FREQUENCY
OPERATIONAL AMPLIFIER



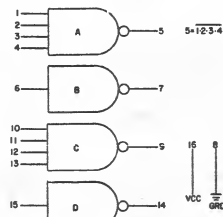
559C QUAD VOICE FREQUENCY
DC AND VOICE FREQUENCY
OPERATIONAL AMPLIFIER



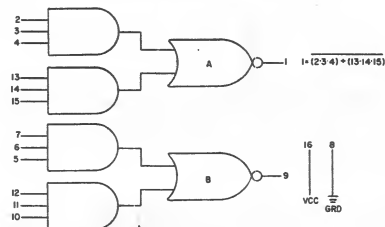
41N QUAD 2-2-3-3 NAND GATE
TTL (L) 5.0V



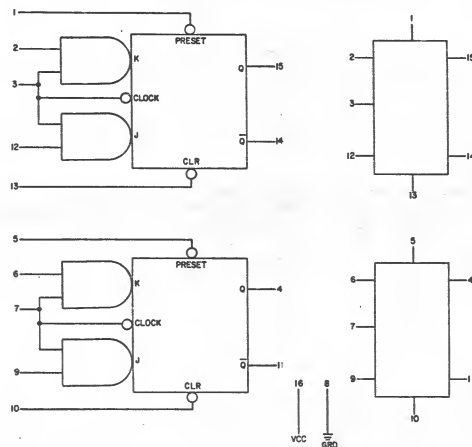
41P QUAD 1-1-4-4 NAND GATE
TTL (L) 5.0V



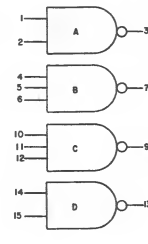
41R DUAL 2-WIDE, 3-INPUT OR-OR-INVERT GATE
TTL (L) 5.0V



41S DUAL J-K FLIP-FLOP
TTL (L) 5.0V



41U QUAD 2-2-3-3 NAND GATE
TTL (M) 5.0V



MINI-ROTL

2

SD-99392-01-D12

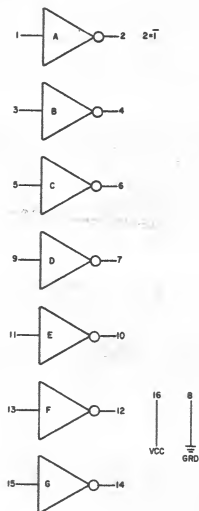
BELL TELEPHONE LABORATORIES

65

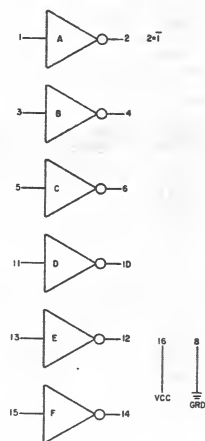
PRINTED IN U.S.A.

INFORMATION NOTES (CONT):
305.

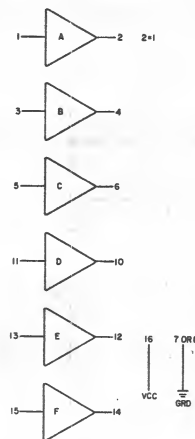
418P SEVEN INVERTERS
TTL (M) 5.0V



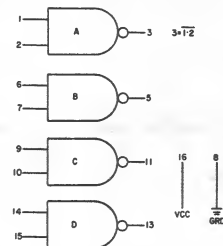
418S HEX INVERTER BUFFER / DRIVER GATE
(OPEN COLLECTOR, 15 VOLT OUTPUT)
TTL (M) 5.0V



418T HEX BUFFER / DRIVER GATE
(OPEN COLLECTOR, 15 VOLT OUTPUT)
TTL (M) 5.0V

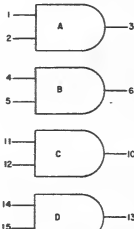


41CA QUAD 2-INPUT BUFFER NAND GATE
(OPEN COLLECTOR)
TTL (M) 5.0V

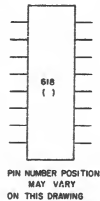


INFORMATION NOTES (CONT):
325.

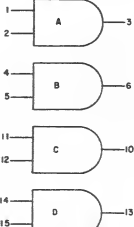
41EG QUAD 2-INPUT POSITIVE AND GATE
(OPEN COLLECTOR OUTPUT)
TTL(M)5.0V



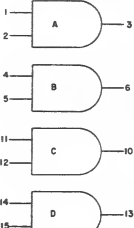
618 SERIES
STAR FILTER



41EH QUAD 2-INPUT POSITIVE AND GATE
(WITH TOTEM-POLE)
TTL(M)5.0V



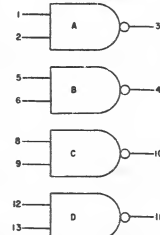
41FF QUAD 2-INPUT POSITIVE AND GATE
(WITH TOTEM-POLE)
TTL(L)5.0V



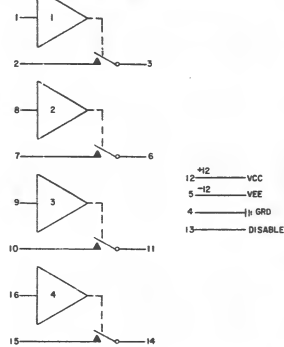
CODE	FILTER SPECIFICATIONS AND FREQUENCIES											
	DB	HZ	DB	HZ	DB	HZ	DB	HZ	DB	HZ	DB	HZ
6180K	-37.7 ± 3	900	-22.7 ± 1.5	995	-18 ± 2.0	1030	607 ± 3	1180	-2.5 ± 3.5	3000		
6180L	0 ± 1.5	100	-11.8 ± 1.0	890	3.1 ± 3.5	940	-20.7 ± 3.0	1020	-11.7 ± 1.0	1100		
6180M	-2.5 ± 1.5	100	-5.2 ± 1.5	950	-2.7 ± 1.5	950	-17.5 ± 1.5	1025	-10.3 ± 1.5	1080		
6180N	4.76 ± 1.5	623	7.76 ± 1.5	934	4.76 ± 1.5	1400						
6180P	11.1 ± 1.5	1903	14.1 ± 1.5	2542	11.1 ± 1.5	3396						
6180R	15.1 ± 2	2911	18.2 ± 2	3493	15.1 ± 2	4190						
6180S	4.66 ± 2	400	-5.26 ± 2	1000	-21.4 ± 2	2000						
6180T												
6180U												
6180V												
6180Y												
618EA												
618EB												
618EC												
618ED												
618EE												
618EF												
618EW												
618KY												
618LA												
618FV	-43.2 ± 1.5 #	500	15.1 ± 3	1000	-15.6 ± 5 #	2400						
618FP	-15.8 ± 7 #	500	12.3 ± 2	1400	-8.9 ± 5 #	2400						
618FR	-21.1 ± 5	500	7.4 ± 2	1200	-51.9 ± 6.8 #	2400						
618FS	-18.7 ± 6.8 #	1200	-1.8 ± 3	1300	-5.9 ± 2 #	2000						
618FT	-5.9 ± 2 #	1000	11.2 ± 2	1300	-35.5 ± 1.8 #	2000						
618FU	-10.2 ± 2 #	1000	31.1 ± 3	1300	-14.6 ± 2 #	2000						
618FW	-34.8 ± 6 #	500	-1.9 ± 2	1000	-9.7 ± 6 #	1200						
618FT	-8.7 ± 2 #	500	5.1 ± 2	1000	-10.6 ± 4 #	1200						
618GA	-41.8 ± 6.8 #	1500	-8 ± 3	2200	-1.9 ± 2 #	2800						
618GB	-6.6 ± 2 #	1500	1.0 ± 3	2200	-39.7 ± 11.1 #	2800						
618GC	-2.7 ± 2	200	-1.0 ± 2	1000	-1.1 ± 2	2500						
618GD	-10.5 ± 3 #	200	-4.3 ± 2	1000	-9 ± 2	2500						
618GE	-6.7 ± 2 #	200	1.9 ± 2	1000	2.8 ± 2	2500						
618GF	-11.1 ± 5 #	200	-8 ± 2	1000	-9 ± 2	2500						
618GG	0 ± 2.1	1100	2.97 ± 1.4	1180	-3.03 ± 2.8	1300	-36.4 ± 5	2500	-37.3 ± 3	3500		
618GH	-41.1 ± 47	1250	3.03 ± 1.6	1300	-7.76 ± 5	1400	-35.1 ± 7	1850	-34.5 ± 4	2250		
618GI	-35.1 ± 15	260	-35.2 ± 1.6	410	9.12 ± 3.4	1020	12.49 ± 2.5	1050	6.59 ± 2.5	1135		
618GK	-6.55 ± 1	405	-10.98 ± 1	867	-15.03 ± 1	1200	-33.1 ± 5	2500	-42.2 ± 5	3500		
618GL	-2.3 ± 1	405	5.7 ± 1	550	-8.7 ± 1	740	-19.3 ± 4	1150	-21.5 ± 3	1500		
618GM	-11.8 ± 1	2804	-21.04 ± 1.5	5944	-28.4 ± 1.5	7000	-32.7 ± 5	8000	-23.2 ± 2	15000		
618GN	-6.35 ± 1	2804	7.68 ± 1	5133	-2.24 ± 1.5	8000	-33.7 ± 5	17000	-27.1 ± 5	22000		
618GP	-7.12 ± 1	1004	-9.9 ± 1	1440	-14.15 ± 1.5	2000	-38.1 ± 5	4500	-41.8 ± 5	5500		
618GS	7.5 ± 1	1004	2.12 ± 1	1440	-2.63 ± 1.5	1300	-23.3 ± 5	2700	-27.0 ± 5	3500		
* 618G5	281.14	619	3.28 ± 1.4	656	28 ± 2.2	695						
* 618GT	3.02 ± 1.4	698	6.02 ± 1.4	739	3.02 ± 2.2	783						
* 618GU	36.1 ± 8	818	3.36 ± 1.8	856	36 ± 2.8	895						
* 618GV	3.02 ± 1.8	898	6.02 ± 1.8	940	3.02 ± 2.8	983						
* 618G7	43 ± 2	1018	3.43 ± 2	1056	43 ± 3.2	1096						
* 618H	3.02 ± 2	1100	6.02 ± 2	1141	3.02 ± 2	1183						
* 618H5	5.1 ± 2.4	1217	3.51 ± 2.6	1255	5.1 ± 3.6	1295						
* 618HC	3.02 ± 2.4	1300	6.02 ± 2.6	1341	3.02 ± 3.8	1383						
* 618HD	552 ± 28	1413	3.55 ± 2.8	1453	551 ± 42	1494						
* 618HE	3.02 ± 2.8	1500	6.02 ± 2.8	1542	3.02 ± 4.2	1586						
* 618HF	54 ± 3	1612	3.64 ± 3.2	1652	54 ± 4.6	1694						
* 618HG	3.02 ± 3	1700	6.02 ± 3.2	1742	3.02 ± 4.6	1786						

* IS A SYMBOL FOR (-∞) OR MAXIMUM NEGATIVE VARIATION.
* IS USED TO INDICATE FREQUENCIES ROUNDED TO NEAREST HZ.

CL-093, CMOS QUAD 2-INPUT NAND
SCHMITT TRIGGER GATES,
RCA OR EQUIVALENT



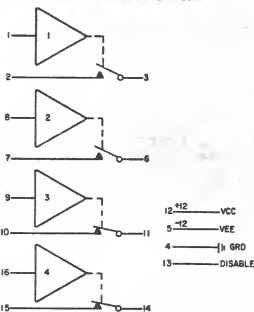
6180BZ KS-22116.L1
QUAD SPST JFET ANALOG
SWITCHES - 4 NORMALLY OPEN
SWITCHES WITH DISABLE.
NATIONAL SEMI-CONDUCTOR OR EQUIVALENT



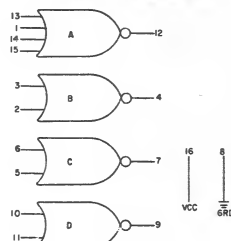
ISSUE
3B

INFORMATION NOTES (CONT):

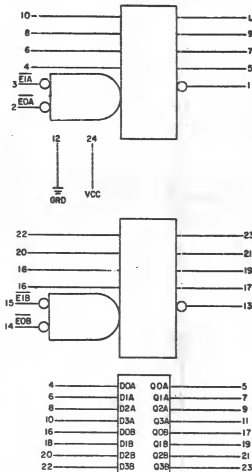
LM3355: KS-2216L2
QUAD SPST JFET ANALOG SWITCHES
2 NORMALLY OPEN AND 2 NORMALLY CLOSED
SWITCHES WITH DISABLE,
NATIONAL SEMI-CONDUCTOR OR EQUIVALENT



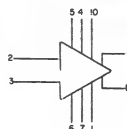
90100C NOR GATES, FAIRCHILD OR EQUIVALENT



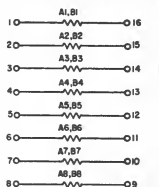
95100P6 KS-2128A, L2
DUAL 4-BIT D LATCH,
FAIRCHILD OR EQUIVALENT



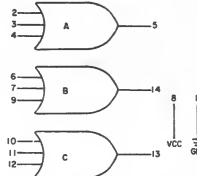
MA727 TEMPERATURE-CONTROLLED
DIFFERENTIAL PREAMPLIFIER,
FAIRCHILD OR EQUIVALENT



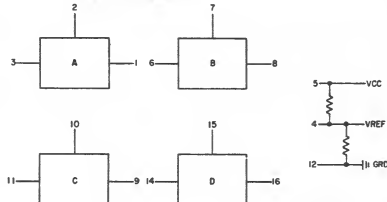
KS-2128B, L1, RESISTOR NETWORKS



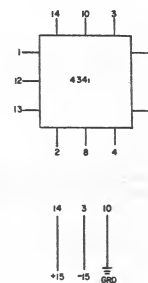
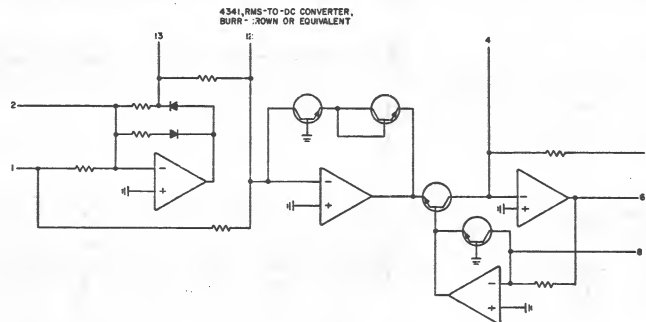
SP374A, TRIPLE THREE INPUT OR GATES,
SIGNETICS OR EQUIVALENT



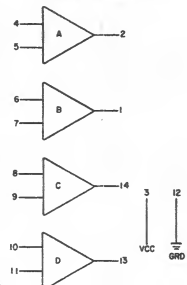
NE559, QUADTIMER,
SIGNETICS OR EQUIVALENT



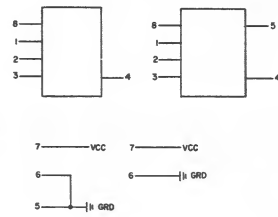
INFORMATION NOTES (CONT):
SOS.



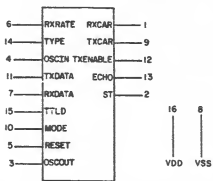
MC3302P QUAD COMPARATOR,
MOTOROLA OR EQUIVALENT



HP5082-7300, NUMERIC AND HEXADECIMAL INDICATORS,
HEWLETT PACKARD OR EQUIVALENT



MC14412YL, UNIVERSAL LOW SPEED MODEM,
MOTOROLA OR EQUIVALENT
(SEE NOTE 1)

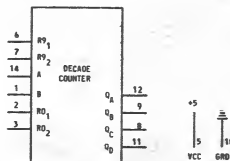


NOTES

1 THIS IS A COMPLEX DEVICE. ANY EXPLANATORY DATA
SHOULD BE OBTAINED FROM MANUFACTURERS' DATA
SHEETS.

INFORMATION NOTES (CONT.):

305. 74190 HIGH SPEED DECADE COUNTER SN74190,
TEXAS INSTRUMENTS OR EQUIVALENT.

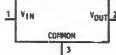


INPUT/OUTPUT INFORMATION

RESET INPUTS				OUTPUT		
R01	R02	R01	R02	Q0	Q0	QA
H	H	L	L	L	L	L
H	H	H	H	H	L	H
X	X	X	X			COUNT
X	X	X	X			COUNT
X	X	X	X			COUNT
X	X	X	X			COUNT

CIRCUIT DESCRIPTION

614A VOLTAGE REGULATOR, MCO

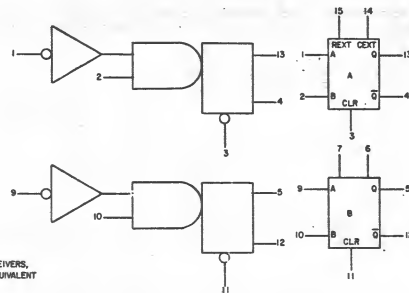


INPUT/OUTPUT INFORMATION

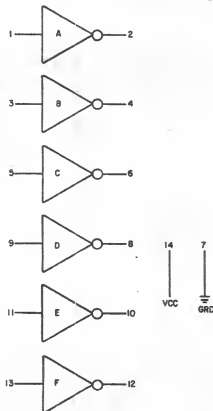
CIRCUIT DESCRIPTION

THE 614A INTEGRATED CIRCUIT IS A THREE TERMINAL, POSITIVE, PRESET VOLTAGE REGULATOR (5 VOLTS $\pm$ 3%). THIS REGULATOR HAS INTERNAL CURRENT LIMITING, SAFE AREA COMPENSATION, AND THERMAL SHUTDOWN CAPABILITY.

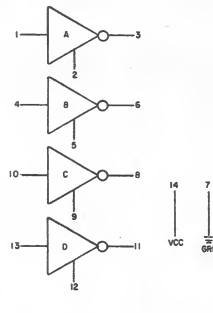
SN74123N, RETRIGGERABLE MONOSTABLE MULTIVIBRATORS WITH CLEAR,
TEXAS INSTRUMENTS OR EQUIVALENT



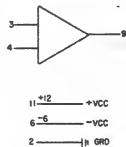
SN7414N, HEX SCHMITT-TRIGGER INVERTERS,
TEXAS INSTRUMENTS OR EQUIVALENT



SN75189N, QUAD LINE RECEIVERS,
TEXAS INSTRUMENTS OR EQUIVALENT



SN7270N, DIFFERENTIAL COMPARATOR,
TEXAS INSTRUMENTS OR EQUIVALENT

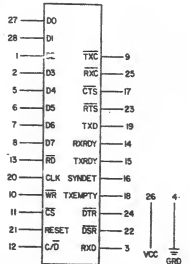
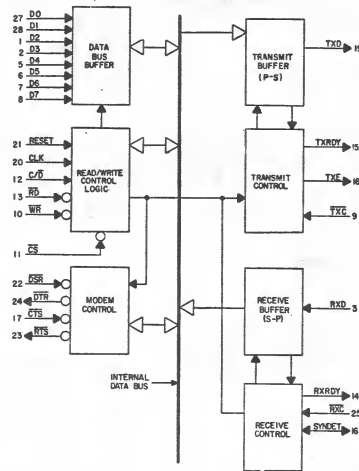


INFORMATION NOTES (CONT):

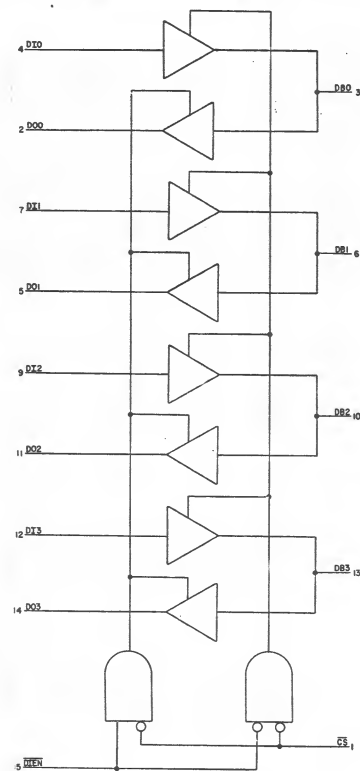
306.

888A-KS-2192LL1
PROGRAMMABLE COMMUNICATION
INTERFACE, INTEL OR EQUIVALENT
(SEE NOTE 1)

78888B-KS-21755LL1, 4-BIT PARALLEL BIDIIRECTIONAL BUS DRIVER, INTEL,
TEXAS INSTRUMENTS OR EQUIVALENT (SEE NOTE 1)



PIN NAME	PIN FUNCTION
D0-D7	DATA BUS (8 BITS)
C/D	CONTROL OR DATA IS TO BE WRITTEN OR READ
RD	READ DATA COMMAND
WR	WRITE DATA OR CONTROL COMMAND
CS	CHIP ENABLE
CLK	CLOCK PULSE (TTL)
RESET	RESET
TXE	TRANSMITTER EMPTY
TXD	TRANSMITTER DATA
RXD	RECEIVER DATA
RXRDY	RECEIVER READY (HAS CHARACTER FOR 8080)
TXRDY	TRANSMITTER READY (READY FOR CHARACTER FROM 8080)
DSR	DATA SET READY
DTR	DATA TERMINAL READY
SYNDET	SYNC DETECT
RTS	REQUEST TO SEND DATA
CTS	CLEAR TO SEND DATA
TXE	TRANSMITTER EMPTY
VCC	+5 VOLT SUPPLY
GRD	GROUND



D0	4
D1	7
D2	9
D3	12
D0	2
D1	5
D2	11
D3	14

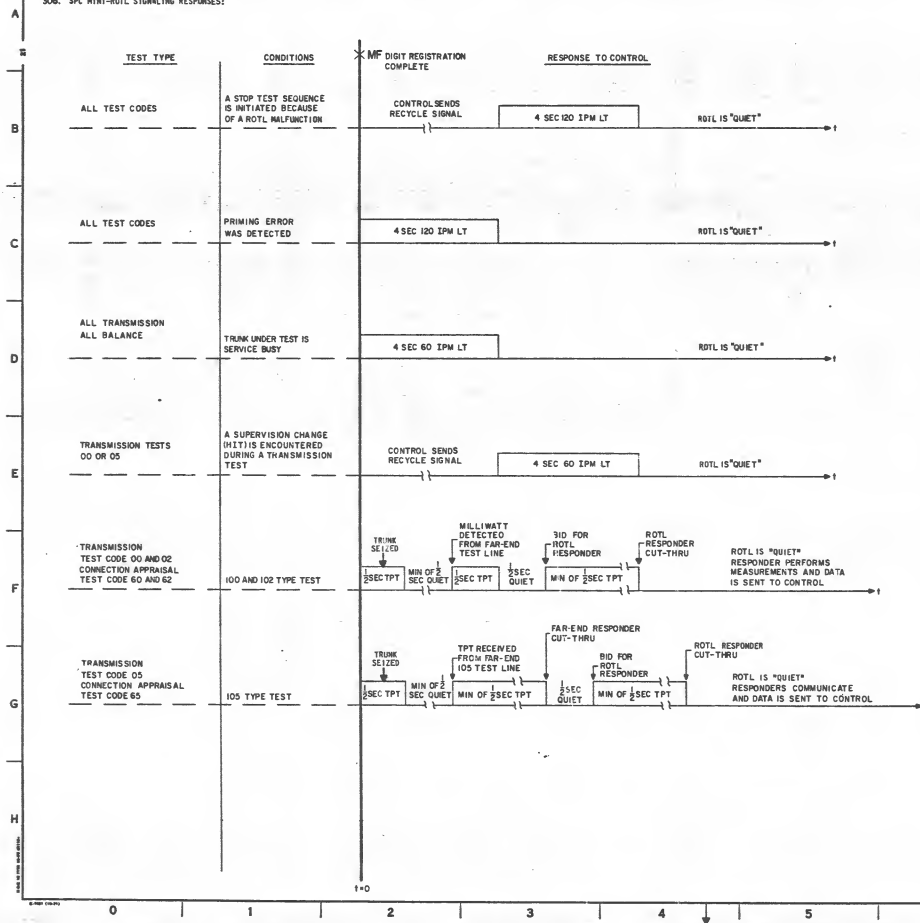
PIN NAME	PIN FUNCTION
DB0 - DB3	DATA BUS BIDIIRECTIONAL
D0 - D3	DATA INPUT
D0 - D3	DATA OUTPUT
DTEN	DATA IN ENABLE DIRECTIONAL CONTROL
CS	CHIP SELECT



NOTES:
1. THIS IS A COMPLEX DEVICE. ANY EXPLANATORY DATA SHOULD BE OBTAINED FROM MANUFACTURERS DATA SHEETS.

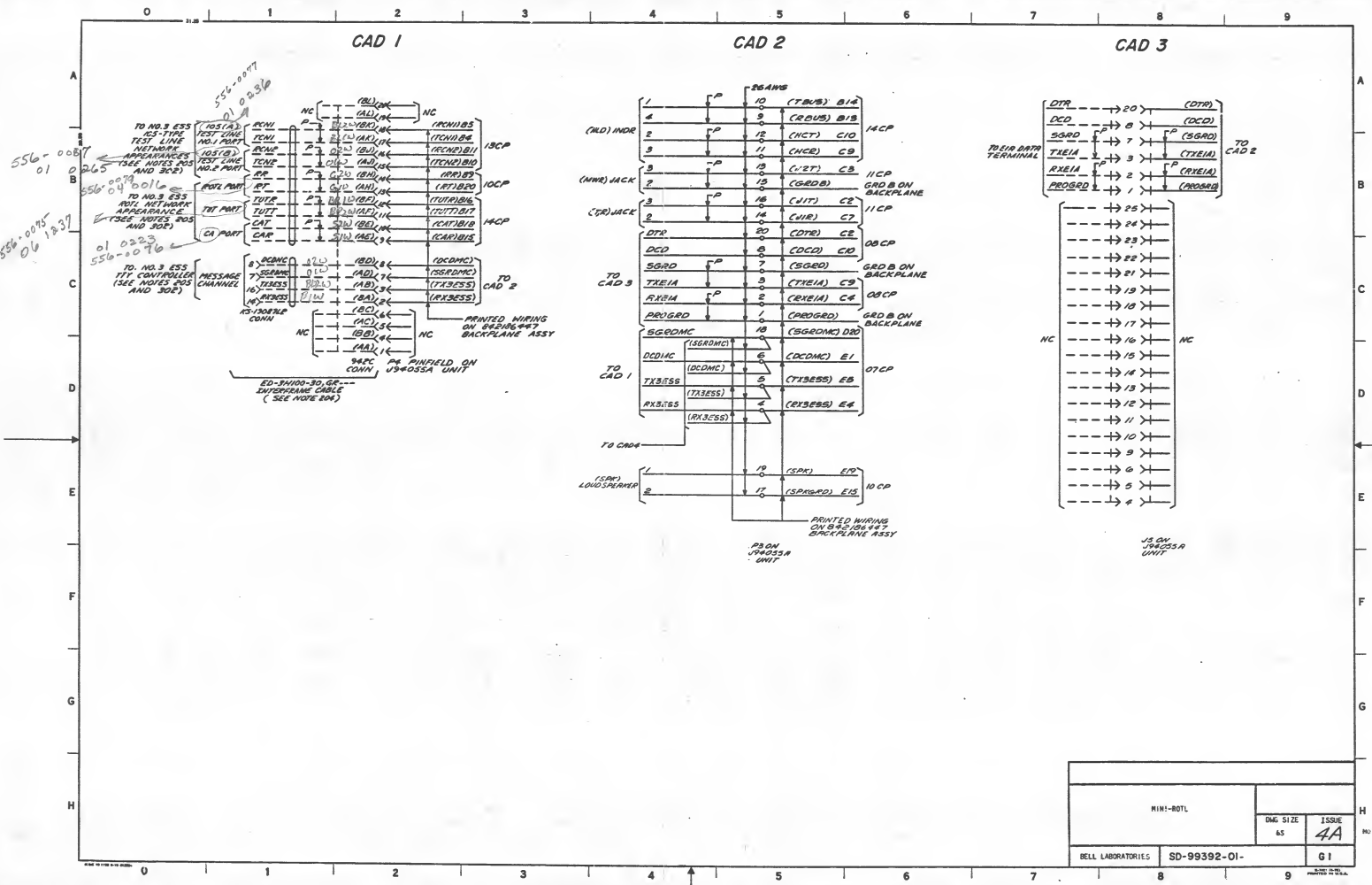
INFORMATION NOTES (CONT):

306. SPC MINI-ROTL SIGNALING RESPONSES:



NOTES:
1. THESE TESTING CAPABILITIES SHALL BE PROVIDED BY FIRMWARE SUBSEQUENT TO ISSUE 1.

LEGEND:
LT = LOW TONE.
TPT = TEST PROGRESS TONE (2225 HZ).

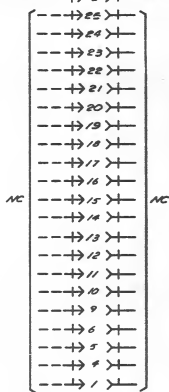
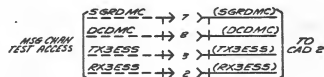


0 1 2 3 4 5 6 7 8 9

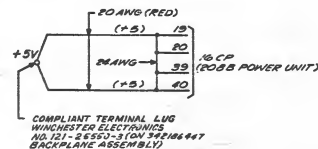
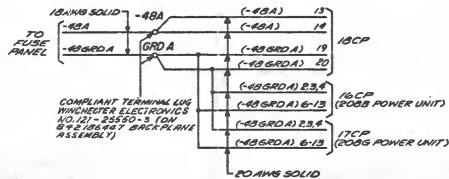
CAD 4

CAD 5

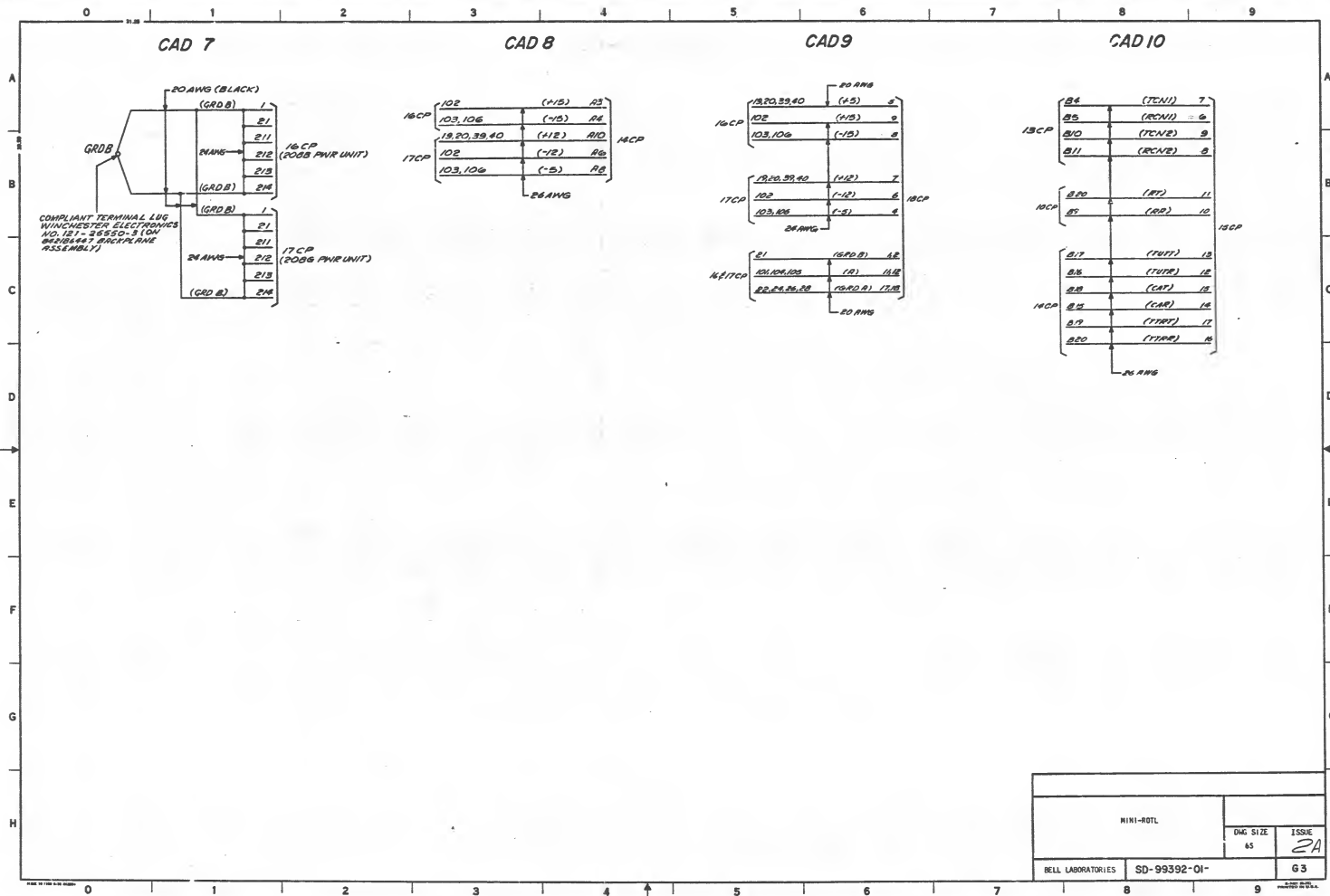
CAD 6



14 ON
 J94033A
 SHIP



MINI-ROT		
DMC SIZE MS	ISSUE 2A	
BELL LABORATORIES	SD-99392-01-	
62		



MINI-ROTL		DWG SIZE 85	ISSUE 2A
BELL LABORATORIES	SD-99392-01	63	

MULTIFREQUENCY RECEIVER AND TONE GENERATORS

- INPUT / OUTPUT STEERING AND LATCH CIRCUIT

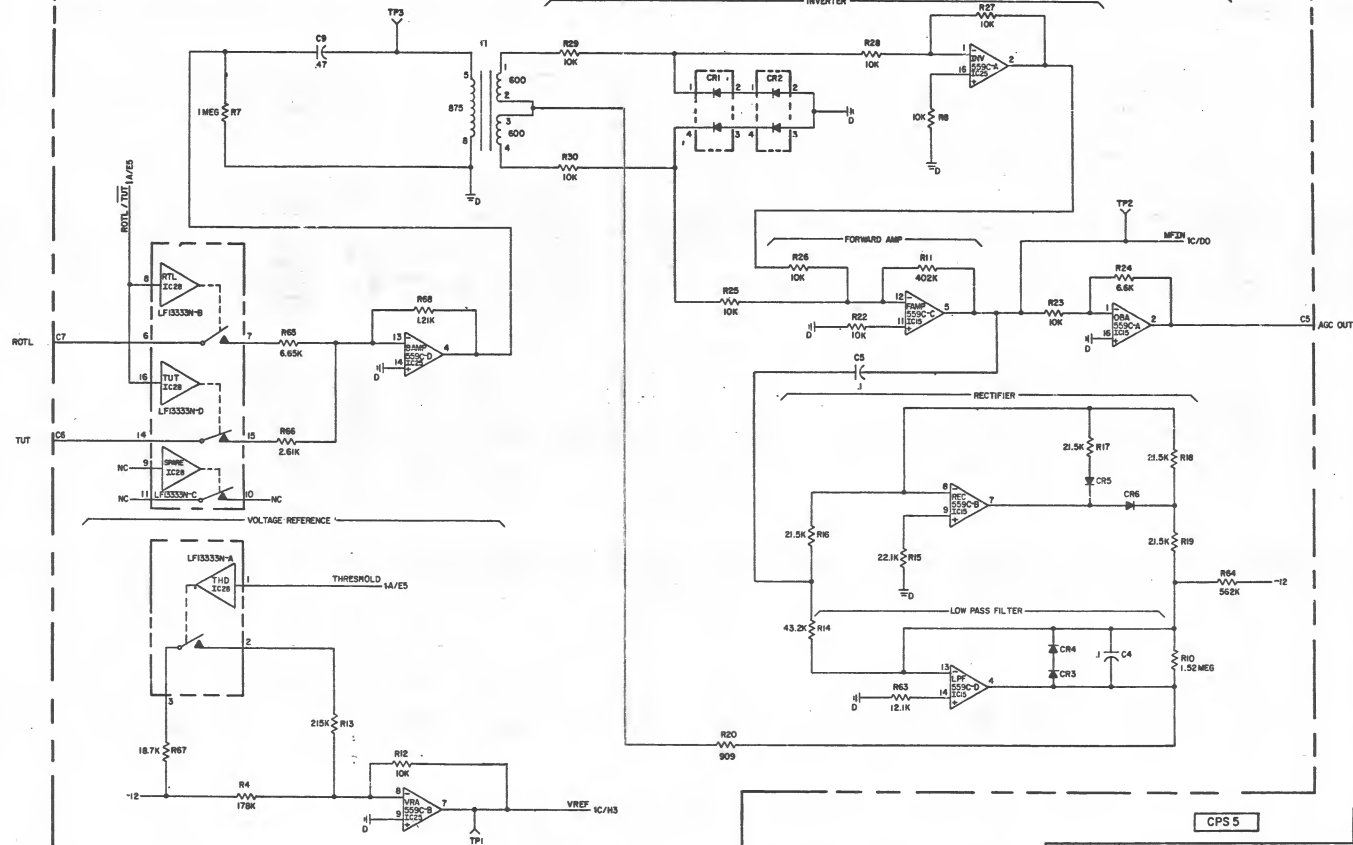
BELL TELEPHONE LABORATORIES
INCORPORATED

SD- 99392-01-JIA

65 PRINTED IN U. S. A.

P/O CPS 5 MULTIFREQUENCY RECEIVER AND TONE GENERATORS

AUTOMATIC GAIN CONTROL INVERTER



CPS 5

ISSUE
/

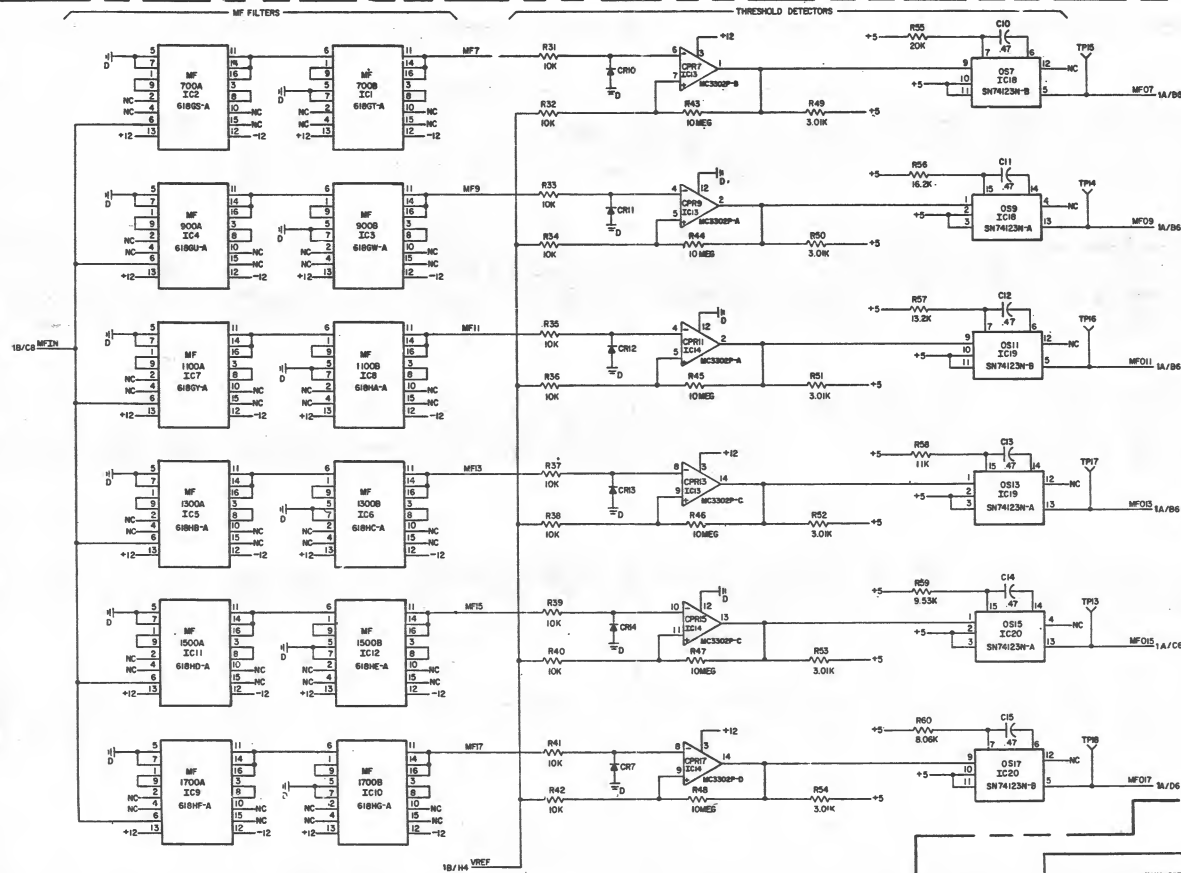
MINI-RTL

BELL TELEPHONE LABORATORIES
INCORPORATED

65

SD-99392-01-J18

P/O CPS 5 MULTIFREQUENCY RECEIVER AND TONE GENERATORS



CPS 5

R181-ROTL

BELL TELEPHONE LABORATORIES

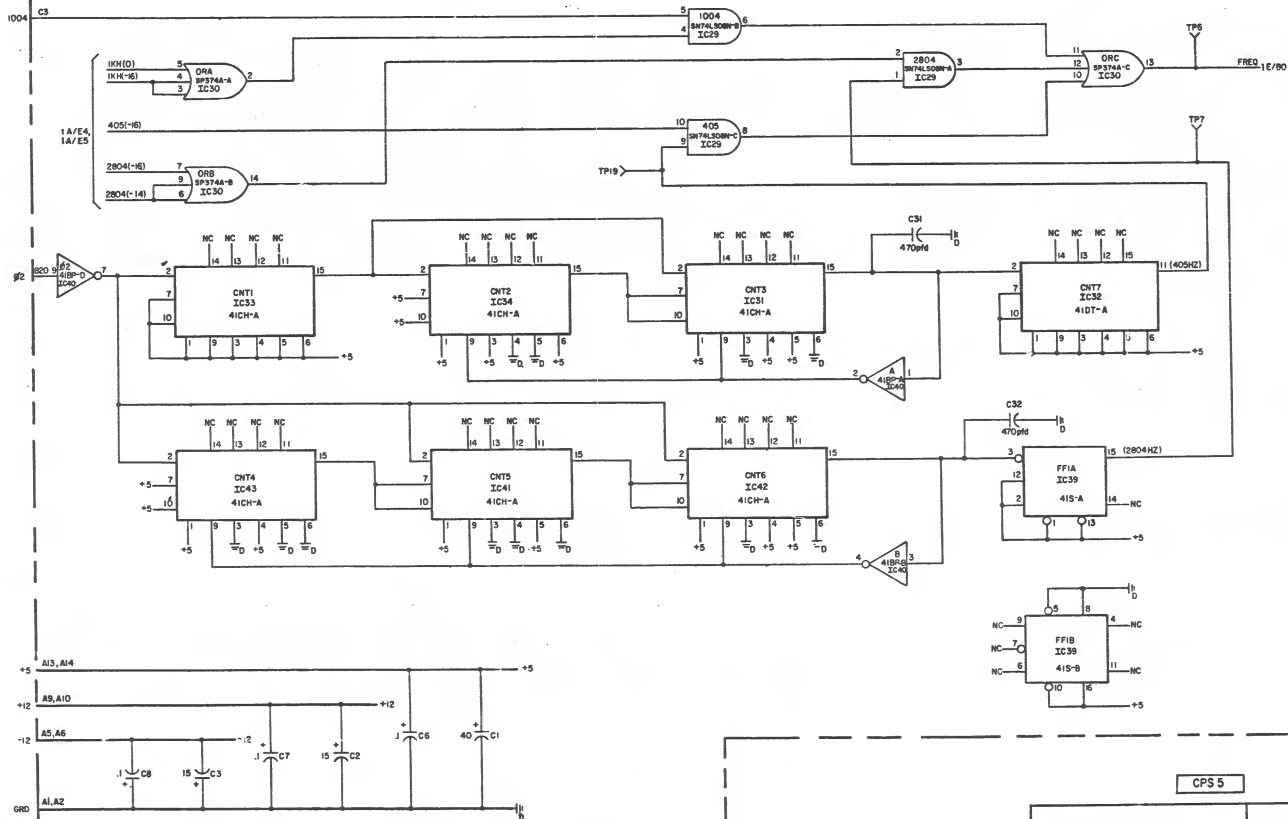
65

SD-99332-01-JIC

P/O CPS 5

MULTIFREQUENCY RECEIVER AND TONE GENERATORS

TEST TONE FREQUENCY GENERATOR



CPS 5

NUM-80TL

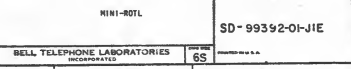
BELL TELEPHONE LABORATORIES

SD-99392-01-JID

ISSUE 1

MULTIFREQUENCY RECEIVER AND TONE GENERATORS

TEST TONE FILTERS



COMPONENT LIST

INTEGRATED CIRCUITS

LOC ON CP	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC13	IC14	IC15	LOC ON CP
CODE	#618ST	#618S3	#618SW	#618SU	#618B4	#618HC	#618BY	#618BA	#618HF	#618HC	#618D	#618E	MC3302P	MC3302P	490C	CODE
ELEM IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELEM IDENT
A	MF100B	1C/42	MF100A	1C/41	MF100B	1C/42	MF100A	1C/41	MF100B	1C/42	MF100A	1C/41	MF100B	1C/42	MF100A	1C/41
B																
C																
D																
E																
F																
G																

SEE NOTE 1

LOC ON CP	IC16	IC17	IC18	IC19	IC20	IC21	IC22	IC23	IC24	IC25	IC26	IC27	IC28	IC29	IC30	LOC ON CP
CODE	#618BL	#618BK	SN74123N	SN74123N	SN74123N	#618BP	#618BP	LF1333N	LF1333N	MC6C	#618M	#618M	LF1333N	SN74130N	SN74130N	CODE
ELEM IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELEM IDENT
A	400B	1E/43	405A	1E/42	037	1C/47	031	1C/47	037	1E/47	1004B	1E/03	1004A	1E/02	1004A	1E/03
B																
C																
D																
E																
F																
G																

SEE NOTE 2

SEE NOTE 3

SEE NOTE 3

SEE NOTE 2

SEE NOTE 4

LOC ON CP	IC31	IC32	IC33	IC34	IC35	IC36	IC37	IC38	IC39	IC40	IC41	IC42	IC43	LOC ON CP
CODE	#41CH	#41DT	#41CH	#41CH	#50DS	MSM741327N	MSM741327N	#93,08PC	41S	41BP	#41CH	#41CH	#41CH	CODE
ELEM IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELEM IDENT
A	CH13	10/09	CH17	10/09	CH11	10/01	CH12	30/09	FRIG	1C/02	CH11	10/01	CH12	30/09
B														
C														
D														
E														
F														
G														

SEE NOTE 2

SEE NOTE 5

*SINGLE ELEMENT IC

CAPACITORS

DESIG	LOC	CODE
C1	10/63	602A
C2	10/63	602P
C3	10/61	602F
C4	10/68	
C5	10/66	
C6	10/63	
C7	10/62	
C8	10/61	
C9	10/62	
C10	1C/47	
C11	1C/47	
C12	1C/47	
C13	1C/47	
C14	1C/47	
C15	1C/47	
C16	1C/47	
C17	1C/47	
C18	1C/47	
C19	1C/47	
C20	1C/47	
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C90	1C/47	
C91	1C/47	
C92	1C/47	
C93	1C/47	
C94	1C/47	
C95	1C/47	
C96	1C/47	
C97	1C/47	
C98	1C/47	
C99	1C/47	
C100	1C/47	

DIODES

DESIG	LOC	CODE
CR1	1B/85	4758
CR2	1B/85	4758
CR3	1B/77	
CR4	1B/67	458C
CR5	1B/67	
CR6	1B/68	
CR7	1C/64	IN3666
CR8	1E/01	IN825
CR9	1E/01	IN825
CR10	1C/44	
CR11	1C/44	
CR12	1C/44	
CR13	1C/44	
CR14	1C/44	

SEE NOTE 1

POTENTIOMETERS

DESIG	LOC	CODE
R69	1E/06	
R70	1E/06	
R71	1E/06	
R72	1E/06	
R73	1E/06	

KS-19646, L3A, 2K
KS-19646, L3A, 5K
KS-19646, L3A, 25K

NOTES:

1. ALL MC AND IN-CODES MAY BE OBTAINED FROM "MOTOROLA" OR EQUIVALENT.
2. ALL SN CODES MAY BE OBTAINED FROM "TEXAS INSTRUMENTS" OR EQUIVALENT.
3. ALL LF CODES MAY BE OBTAINED FROM "NATIONAL" OR EQUIVALENT.
4. MAY BE OBTAINED FROM "SIGNETICS" OR EQUIVALENT.
5. ALL SP CODES MAY BE OBTAINED FROM "FAIRCHILD" OR EQUIVALENT.

CPS 5

MINI-ROT

BELL TELEPHONE LABORATORIES

2

65

SD-99592-01-JIF

P/O CPS 5 MULTIFREQUENCY RECEIVER AND TONE GENERATORS

COMPONENT LIST (CONT)

RESISTORS	LOC	CODE	VALUE
R1	1E/10		31.8K
R2	1E/20		42.2K
R3	1E/30		45.3K
R4	1B/16		17.8K
R5	1E/15	KS-2066LLA	1.5M
R6	1E/10		42.2K
R7	1E/10		1.5M
R8	1E/10		1.5M
R9	1E/10		1.5M
R10	1E/10		1.5M
R11	1E/10		1.5M
R12	1E/10		1.5M
R13	1E/10		1.5M
R14	1E/10		1.5M
R15	1E/10		1.5M
R16	1E/10		1.5M
R17	1E/10		1.5M
R18	1E/10		1.5M
R19	1E/10		1.5M
R20	1E/10		1.5M
R21	1E/10		1.5M
R22	1E/10		1.5M
R23	1E/10		1.5M
R24	1E/10		1.5M
R25	1E/10		1.5M
R26	1E/10		1.5M
R27	1E/10		1.5M
R28	1E/10		1.5M
R29	1E/10		1.5M
R30	1E/10		1.5M
R31	1E/10		1.5M
R32	1E/10		1.5M
R33	1E/10		1.5M
R34	1E/10		1.5M
R35	1E/10		1.5M
R36	1E/10		1.5M
R37	1E/10		1.5M
R38	1E/10		1.5M
R39	1E/10		1.5M
R40	1E/10		1.5M
R41	1E/10		1.5M
R42	1E/10		1.5M
R43	1E/10		1.5M
R44	1E/10		1.5M
R45	1E/10		1.5M
R46	1E/10		1.5M
R47	1E/10		1.5M
R48	1E/10		1.5M
R49	1E/10		1.5M
R50	1E/10		1.5M
R51	1E/10		1.5M
R52	1E/10		1.5M
R53	1E/10		1.5M
R54	1E/10		1.5M
R55	1E/10		1.5M
R56	1E/10		1.5M
R57	1E/10		1.5M
R58	1E/10		1.5M
R59	1E/10		1.5M
R60	1E/10		1.5M
R61	1E/10		1.5M
R62	1E/10		1.5M
R63	1E/10		1.5M
R64	1E/10		1.5M
R65	1E/10		1.5M
R66	1E/10		1.5M
R67	1E/10		1.5M
R68	1E/10		1.5M

TRANSFORMERS	LOC	CODE
T1	1B/13	CS6AR

- NOTES:
- UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
VALUES PRECEDED BY THE SYMBOL * (PLUS)
OR - (MINUS) ARE IN VOLTS.
 - ± GROUND RETURN.
 - DESIGNATED BATTERY AND GROUND RETURN
TERM. FOR ICs.

IC	LOC	15V ON TERM.	12V ON TERM.	12V ON TERM.	GRD ON TERM.	BY PASS CAP TO GRD
CODE	LOC					
MF 700A 61807	IC1	13	12			
MF 700A 61805	IC2	13	12			
MF 900B 61809	IC3	13	12			
MF 900A 61800	IC4	13	12			
MF 300A 61818	IC5	13	12			
MF 1300B 6181C	IC6	13	12			
MF 100A 61807	IC7	13	12			
MF 100B 6181A	IC8	13	12			
MF 1700A 6181H	IC9	13	12			
MF 1700B 6181G	IC10	13	12			
MF 1500A 6181D	IC11	13	12			
MF 800B 6181C	IC12	13	12			
MC3302P	IC13	3	12		12	
MC3302P	IC14	3	12		12	
559C	IC15	6	10			C18
405B 6180L	IC16	13	12			C19
405A 6180K	IC17	13	12			

NOTES (CONT):

IC	LOC	15V ON TERM.	12V ON TERM.	12V ON TERM.	GRD ON TERM.	BY PASS CAP TO GRD
CODE	LOC					
597462N	IC18	13	12			
1004B 6180N	IC19	13	12			
1004A 6180P	IC20	13	12			
559C	IC21	6	10			C21
LF1333N	IC22	13	12			
LF1333N	IC23	13	12			
LF1333N	IC24	13	12			
LF1333N	IC25	13	12			
2804B 6180N	IC26	13	12			
2804A 6180M	IC27	13	12			
LF1333N	IC28	13	12			
597462N	IC29	13	12			
597462N	IC30	13	12			
410T	IC31	13	12			C30
410H	IC32	13	12			C22
410H	IC33	13	12			C23
410H	IC34	13	12			C24
502S	IC35	13	12			C17
597462N	IC36	13	12			C29
597462N	IC37	13	12			
410H	IC38	13	12			
410H	IC39	13	12			
410H	IC40	13	12			
410H	IC41	13	12			C28
410H	IC42	13	12			C27
410H	IC43	13	12			C26

MANUFAC: RING REFERENCES

CATEGORY	NO.
CONTROLLING DRAWING	SD-35065-01
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-35117-()
CONNECTOR ON FRAME	

SEE SHEET J1H

CIRCUIT DESCRIPTION
SEE SD-35065-01.

INPUT / OUTPUT INFORMATION
SEE NOTE 30E.

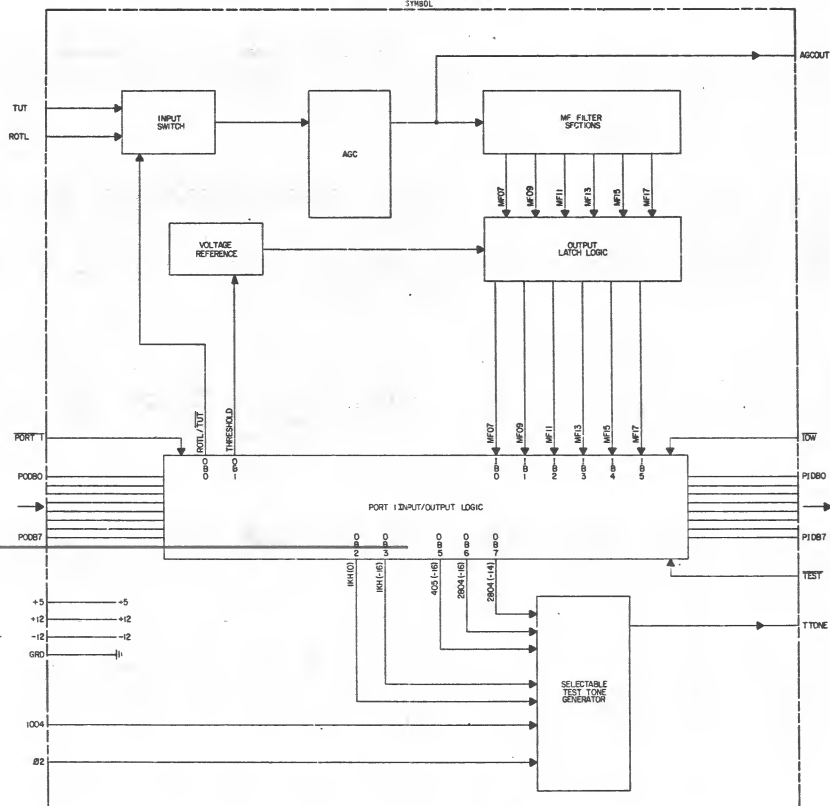
CPS 5

ISSUE 2A

MIL-ITOL	SD-99392-01-J16
BELL TELEPHONE LABORATORIES	ISSUED 1965

P/O CPS 5

MF RECEIVER AND TEST TONE GENERATORS
SYMBOL



P/O CPS 5

RENT-ROT

2

SD-99392-01-JIH

BELL TELEPHONE LABORATORIES

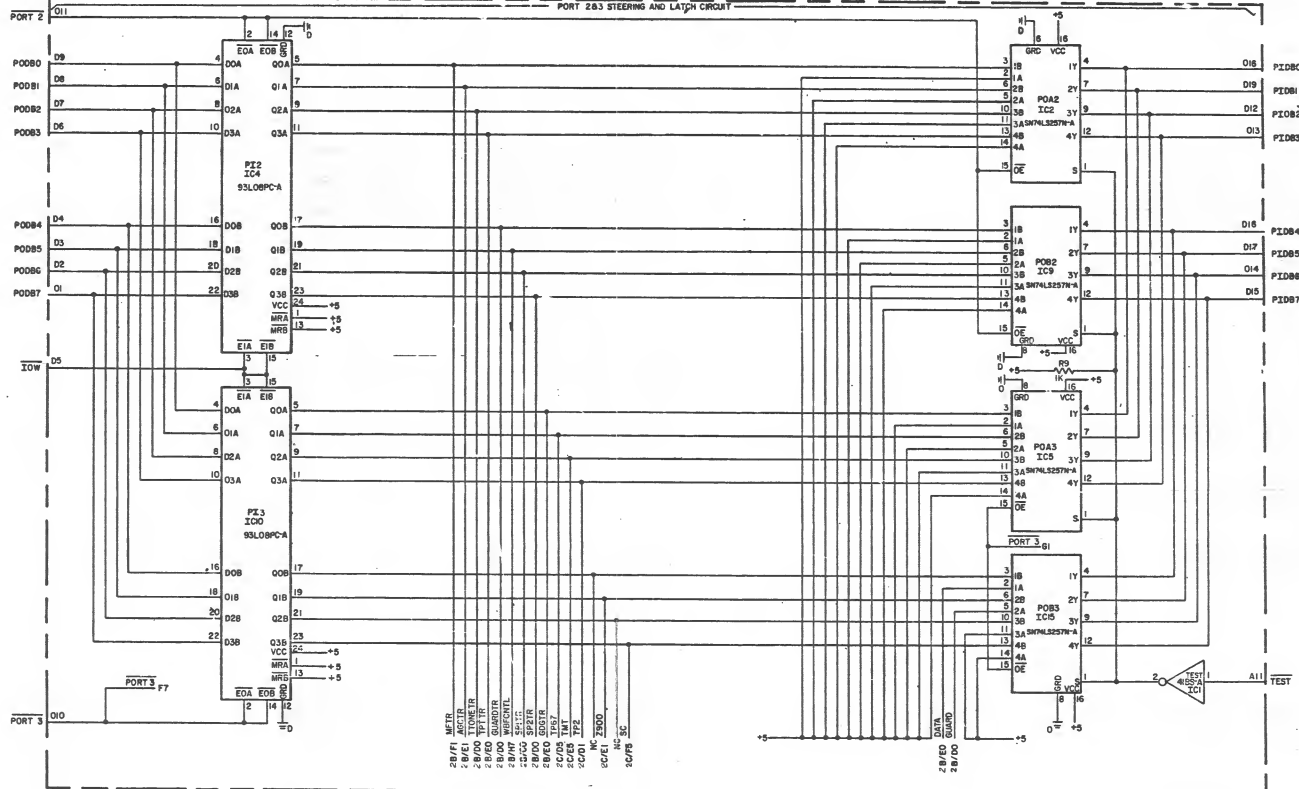
INCORPORATED

65

REPRODUCED

P/O CPS 6 TUT TRANSMIT / RECEIVE AND WIDEBAND FILTERS

PORT 2B3 STEERING AND LATCH CIRCUIT



CPS 6

RINI-B01

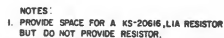
BELL TELEPHONE LABORATORIES
INCORPORATED

SD-99392-01-J2A

65

TUT TRANSMIT / RECEIVE AND WIDEBAND FILTERS

- TRANSMIT AND RECEIVE CIRCUIT



CPS 6

MINI-ROTI

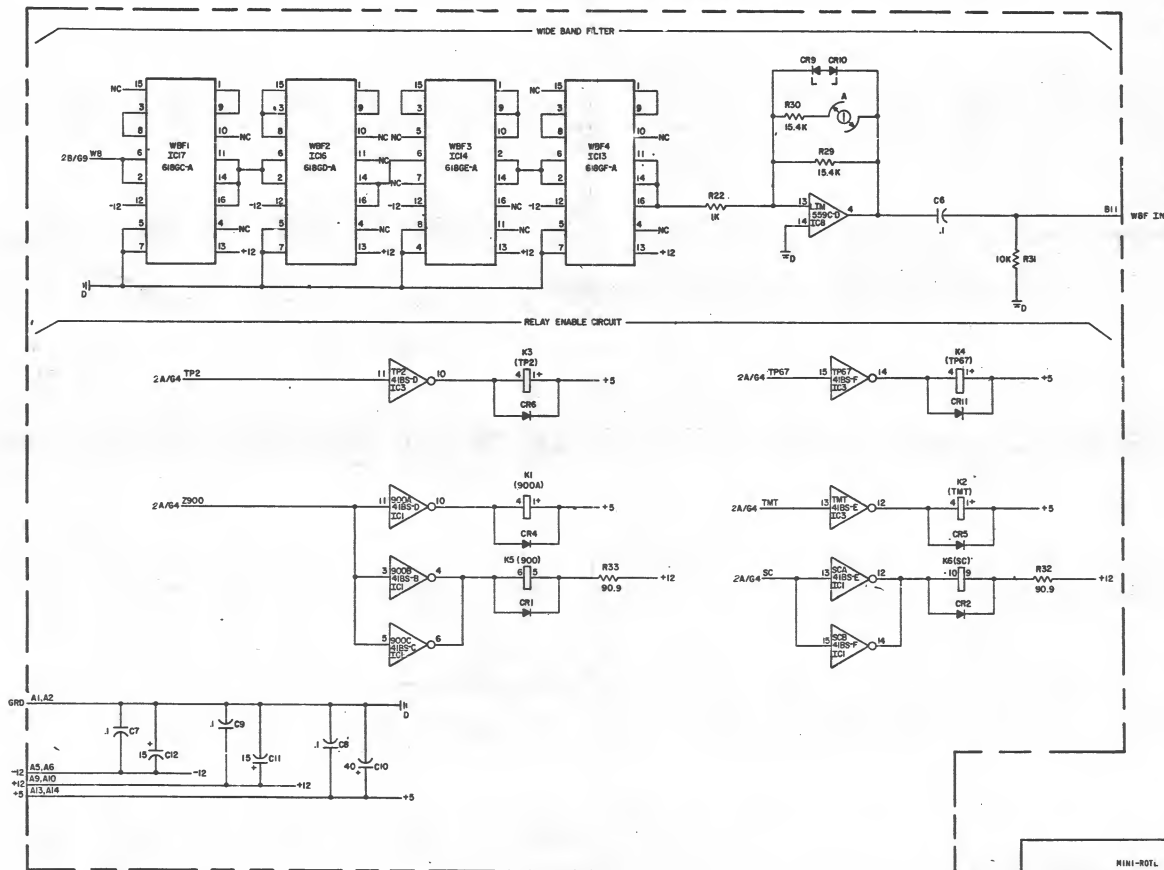
BELL TELEPHONE LABORATORIES

1994

SD-99392-01-J2B

P/O CPS 6

TUT TRANSMIT / RECEIVE AND WIDEBAND FILTERS



CPS 6

ISSUE

MINI-ROTL

BELL TELEPHONE LABORATORIES

65

SD-99392-01-J2C

P/O CPS 6 TUT TRANSMIT/RECEIVE AND WIDEBAND FILTERS

- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS
CAPACITANCE VALUES ARE IN MICROFARADS
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.
2. $\perp$ GROUND RETURN.
3. DESIGNATED BATTERY AND GROUND RETURN
TERM. FOR ICS.

IC		+5V ON TERM.	+8V ON TERM.	+12V ON TERM.	GRD ON TERM.	BY PASS CAP. TO GRD
CODE	LOC					
4IBS	IC1	16			7.8	C14
SN74LS257N	IC2	16			8	C15
4IBS	IC3	16			7.8	C14
93LO8PC	IC4	24			12	C19
SN74LS257N	IC5	16			8	C16
4IR	IC6	16			8	C20
			3			C22
			6			
	IC7			10		
			3	15		C21
559C						C27
	IC8		6			
				10		
				15		C26
SN74LS257N	IC9	16			8	C17
93LO8PC	IC10	24			12	C20
LF13333IN	IC11		12	5	4	C23
	IC12		12	5	4	C25
			13			
W8F4	IC13			12		
6.89F			13			
W8F3	IC14			12		
6.89E						
SN74LS257N	IC15	16			8	C18
W8F2	IC16			13		
6.16GD				12		
W8F1	IC17			13		C28
6.89C				12		C29

MANUFACTURING REFERENCES

CATEGORY	NO.
CONTROLLING DRAWING	SD-35063-01
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-35118-()
CONNECTOR ON FRAME	

SYMBOL
SEE SHEET J27

CIRCUIT DESCRIPTION
SEE CD-35065-01

INPUT / OUTPUT INFORMATION
SEE NOTE 302.

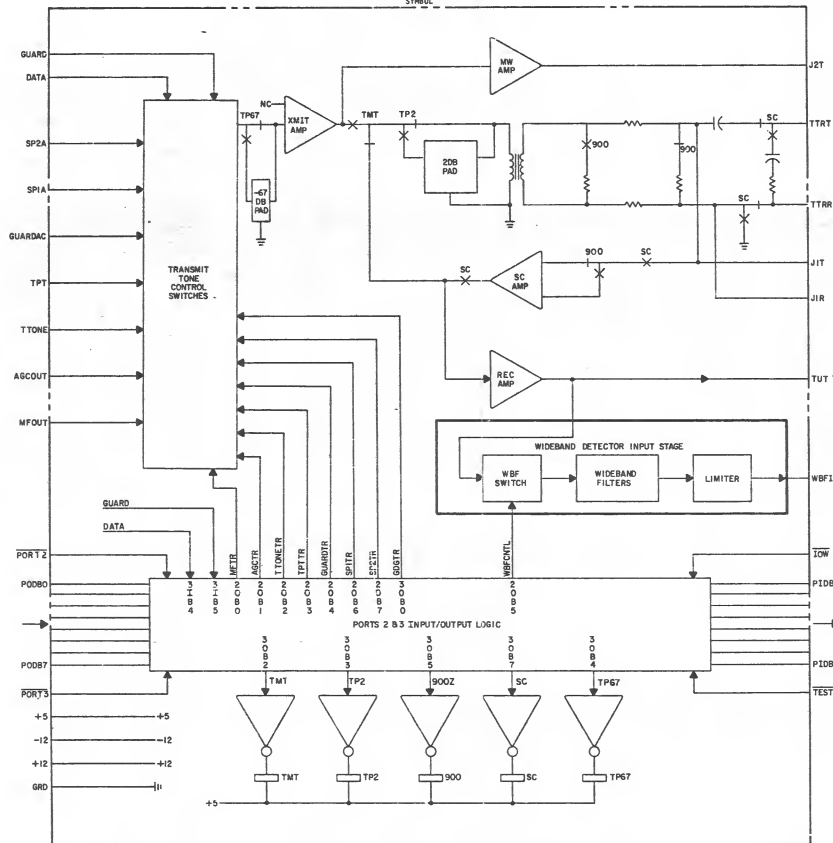
CPS 6

2A

MINI-ROTL	SD-99392-01-J2E
BELL TELEPHONE LABORATORIES INCORPORATED	REVISED BS

P/O CPS 6

TUT TRANSMIT/RECEIVE AND WIDEBAND FILTERS
SYMBOL



P/O CPS 6

ISSUE

1

MINI-ROTL

2

SD-99392-01-J2F

BELL TELEPHONE LABORATORIES

65

PRINTED IN U.S.A.

- PORT 12 AND 13 STEERING AND LATCH CIRCUIT

BELL TELEPHONE LABORATORIES
INCORPORATED

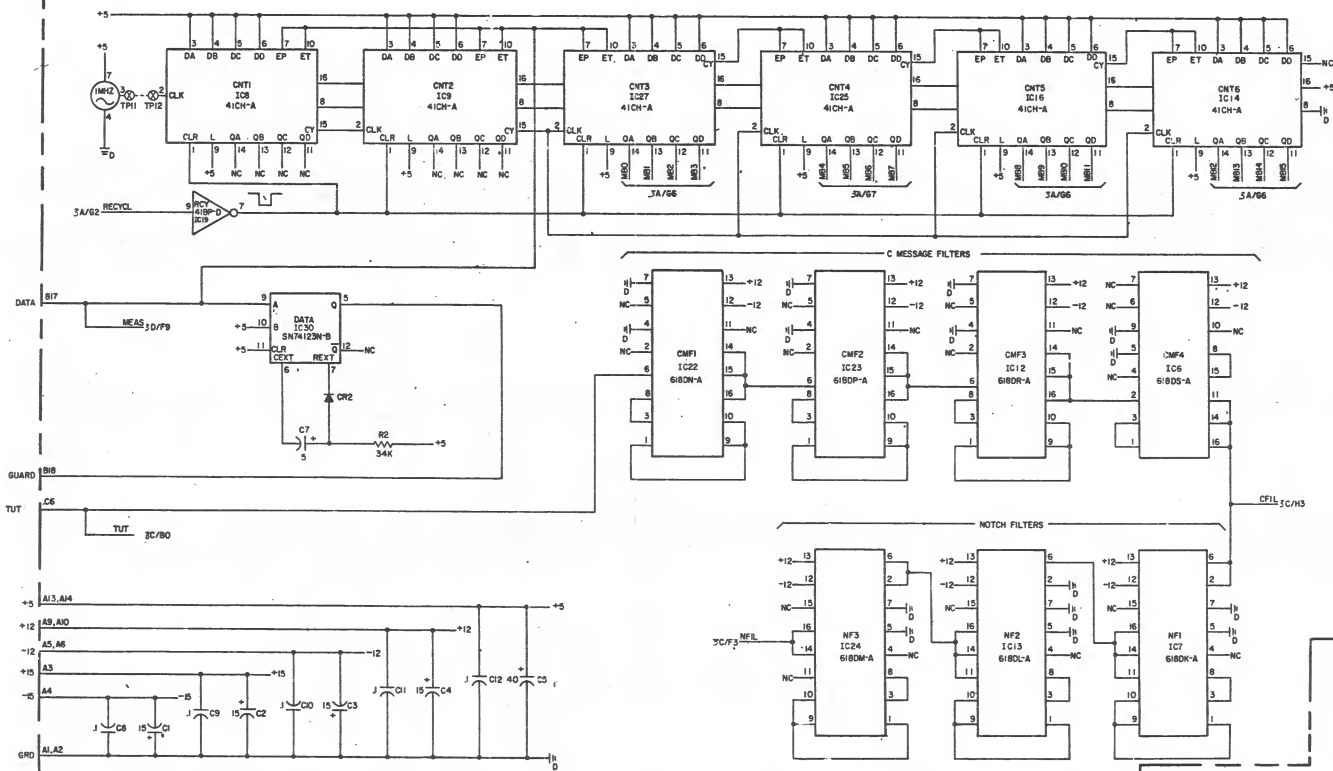
SD-99392-01-J3A

65 PRINTED IN U.S.A.

P/O CPS 7

LOSS AND NOISE MEASUREMENT CIRCUIT

MEASUREMENT COUNTER



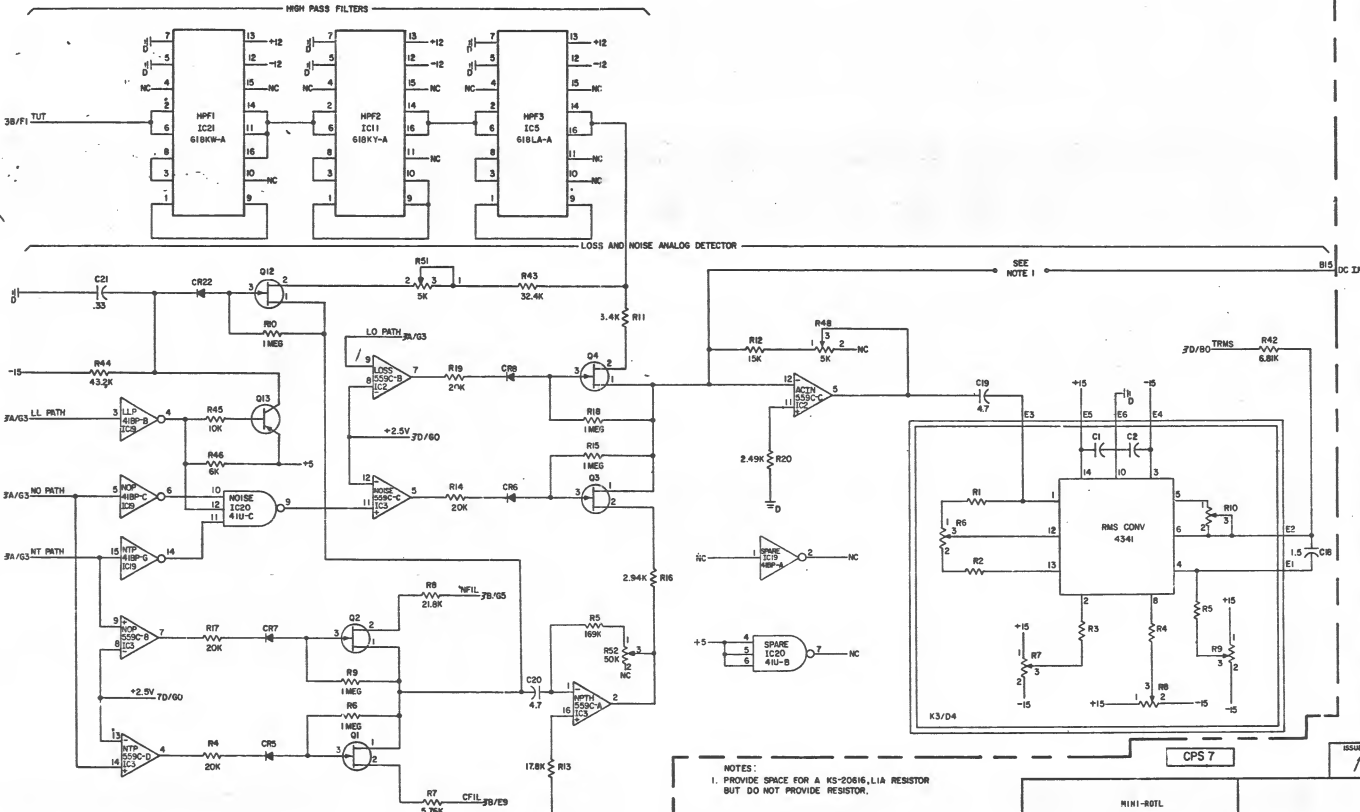
CPS 7

MINI-ROT
BELL TELEPHONE LABORATORIES
INCORPORATED

SD-99392-01-J38

65

LOSS AND NOISE MEASUREMENT CIRCUIT



NOTES:

- I. PROVIDE SPACE FOR A KS-20816, LIA RESISTOR
BUT DO NOT PROVIDE RESISTOR.

CPS 7

MINI-ROTL

BELL TELEPHONE LABORATORIES

SD-99392-01-J3C

69

P/O CPS 7

LOSS AND NOISE MEASUREMENT CIRCUIT

- LOGARITHMIC CONVERTER



MINI-ROTE

SD-99392-01-J3D

BELL TELEPHONE LABORATORIES

100

P/O CPS 7

LOSS AND NOISE MEASUREMENT CIRCUIT

COMPONENT LIST

INTEGRATED CIRCUITS

LOC ON CP	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC13	IC14	IC15	LOC ON CP
CODE	555C	555C	555C	555C	555C	555C	555C	555C	555C	555C	555C	555C	555C	555C	555C	CODE
ELEM IDENT	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	ELEM IDENT
A	LLR	FD/F1	RCY	FD/A1	NTPH	FC/F4	MEAS	FD/VS	MP3	FC/B4	CMF4	FD/VS	MP1	FD/VS	CMT1	A
B	OSC	FD/VS	LOSC	FC/E3	NTP	FC/G1										B
C	NON	FD/VS	ALCN	FC/E6	NOISE	FC/F3										C
D	LOR	FD/VS	CHS	FD/C1	NTP	FC/H1										D
E																E
F																F
G																G

LOC ON CP	IC16	IC17	IC18	IC19	IC20	IC21	IC22	IC23	IC24	IC25	IC26	IC27	IC28	IC29	IC30	LOC ON CP
CODE	418P	418P	418P	418P	418P	418P	418P	418P	418P	418P	418P	418P	418P	418P	418P	CODE
ELEM IDENT	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	ELEM IDENT
A	CHTS	FD/VS	FOA12	FA/ST	PI12	FA/ST	LLP	FD/E1	SPARE	FC/VS	NOISE	FC/F1				A
B							NOP	FC/F1	NOISE	FC/F1						B
C							RCY	FD/C1	MI	FD/VS						C
D							TEST	FA/VS								D
E							MEAS	FD/VS								E
F							NTP	FC/F1								F
G																G

MSINGLE ELEMENT IC

CAPACITORS

DESIG	LOC	CODE
C1	FD/VS	200P
C2	FD/VS	200P
C3	FD/VS	200P
C4	FD/VS	200P
C5	FD/VS	200P
C6	FD/VS	200P
C7	FD/VS	200P
C8	FD/VS	200P
C9	FD/VS	200P
C10	FD/VS	200P
C11	FD/VS	200P
C12	FD/VS	200P
C13	FD/VS	200P
C14	FD/VS	200P
C15	FD/VS	200P
C16	FD/VS	200P
C17	FD/VS	200P
C18	FD/VS	200P
C19	FD/VS	200P
C20	FD/VS	200P
C21	FD/VS	200P

DIODES (CONT)

DESIG	LOC	CODE
CR1	FD/VS	450C
CR2	FD/VS	450C
CR3	FD/VS	450C
CR4	FD/VS	450C
CR5	FD/VS	450C
CR6	FD/VS	450C
CR7	FD/VS	450C
CR8	FD/VS	450C
CR9	FD/VS	450C
CR10	FD/VS	450C
CR11	FD/VS	450C
CR12	FD/VS	450C

POTENTIOMETERS

DESIG	LOC	CODE
R47	FD/VS	10K
R48	FD/VS	10K
R49	FD/VS	10K
R50	FD/VS	10K
R51	FD/VS	10K
R52	FD/VS	10K

RESISTORS

DESIG	LOC	CODE
R1	FD/VS	10K
R2	FD/VS	10K
R3	FD/VS	10K
R4	FD/VS	10K
R5	FD/VS	10K
R6	FD/VS	10K
R7	FD/VS	10K
R8	FD/VS	10K
R9	FD/VS	10K
R10	FD/VS	10K
R11	FD/VS	10K
R12	FD/VS	10K
R13	FD/VS	10K
R14	FD/VS	10K
R15	FD/VS	10K
R16	FD/VS	10K
R17	FD/VS	10K
R18	FD/VS	10K
R19	FD/VS	10K
R20	FD/VS	10K
R21	FD/VS	10K
R22	FD/VS	10K
R23	FD/VS	10K
R24	FD/VS	10K
R25	FD/VS	10K
R26	FD/VS	10K
R27	FD/VS	10K
R28	FD/VS	10K
R29	FD/VS	10K
R30	FD/VS	10K
R31	FD/VS	10K
R32	FD/VS	10K
R33	FD/VS	10K
R34	FD/VS	10K
R35	FD/VS	10K
R36	FD/VS	10K
R37	FD/VS	10K

RESISTORS (CONT)

DESIG	LOC	CODE
R38	FD/VS	10K
R39	FD/VS	10K
R40	FD/VS	10K
R41	FD/VS	10K
R42	FD/VS	10K
R43	FD/VS	10K
R44	FD/VS	10K
R45	FD/VS	10K
R46	FD/VS	10K

TRANSISTORS

DESIG	LOC	CODE
Q1	FD/VS	2N439
Q2	FD/VS	2N439
Q3	FD/VS	2N439
Q4	FD/VS	2N439
Q5	FD/VS	2N439
Q6	FD/VS	2N439
Q7	FD/VS	2N439
Q8	FD/VS	2N439
Q9	FD/VS	2N439
Q10	FD/VS	2N439
Q11	FD/VS	2N439
Q12	FD/VS	2N439
Q13	FD/VS	2N439

NOTES:
1. ALL THIS CODES MAY BE OBTAINED FROM "TEXAS INSTRUMENTS" OR EQUIVALENT.
2. MAY BE OBTAINED FROM "FAIRCHILD" OR EQUIVALENT.
3. ALL IN- AND 2N-CODES MAY BE OBTAINED FROM "MOTOROLA" OR EQUIVALENT.

CPS 7

MINI-BOTL

2

SD-99392-01-J3E

BELL TELEPHONE LABORATORIES

INCORPORATED

65

NEW YORK, N.Y.

P/O CPS 7 LOSS AND NOISE MEASUREMENT CIRCUIT

- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.
2. $\frac{1}{2}$ GROUND RETURN.
3. DESIGNATED BATTERY AND GROUND RETURN
TERMS FOR IC5.

IC	+5V ON TERM.	-5V ON TERM.	+10V ON TERM.	-10V ON TERM.	+15V ON TERM.	-15V ON TERM.	GRD ON TERM.	BY PINS CAP TO GRD
CODE	LOC							
								C46
	IC1							
								C45
								C44
999C	IC2							C43
								C42
	IC3							C41
								C40
SN7270N	IC4							C38
HPF5 6814A	IC5							C37
CMF4 6180S	IC6							C35
WFI 6180K	IC7							C33
4104	IC8							C32
	IC9							C39
MA727	IC10							
HPF2 6814T	IC11							
CMF3 6180R	IC12							
NP2 6802L	IC13							
4101	IC14							
SN74LS257N	IC15							
4103	IC16							
SN74LS257N	IC17							
93LOBPC	IC18							
418P	IC19							
41U	IC20							
WFI 6180W	IC21							
CMF1 6180V	IC22							
CMF2 6180P	IC23							
NP3 6180M	IC24							
4101	IC25							
SN74LS257N	IC26							
4101	IC27							
SN74LS257N	IC28							
93LOBPC	IC29							
SN74123N	IC30							

MANUFACTURING REFERENCES	
CATEGORY	NO.
CONTROLLING DRAWING	SD-35045-01
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-35119-()
CONNECTOR ON FRAME	

SYMBOL
SEE SHEET J36

CIRCUIT DESCRIPTION
SEE CD-3006-01

INPUT/OUTPUT INFORMATION
SEE NOTE 302.

CPS 7

ISSUE

2A

MINI-ROTL

SD-99392-01-J3F

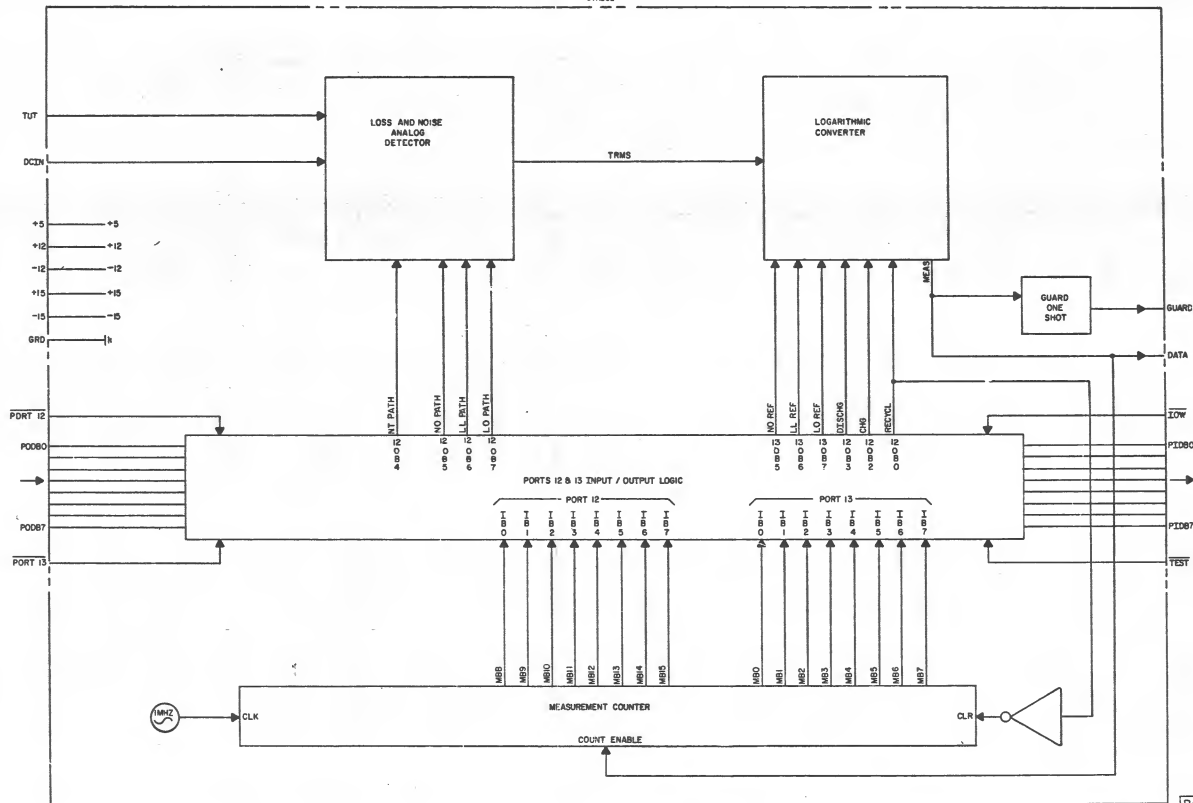
BELL TELEPHONE LABORATORIES

65

REVISION 1.1.2

REVISION 00 0 0 0

P/O CPS 7 LOSS AND NOISE MEASUREMENT CIRCUIT SYMBOL



P/O CPS 7

MINI-BOTL

BELL TELEPHONE LABORATORIES
INCORPORATED

SD-99392-01-J36

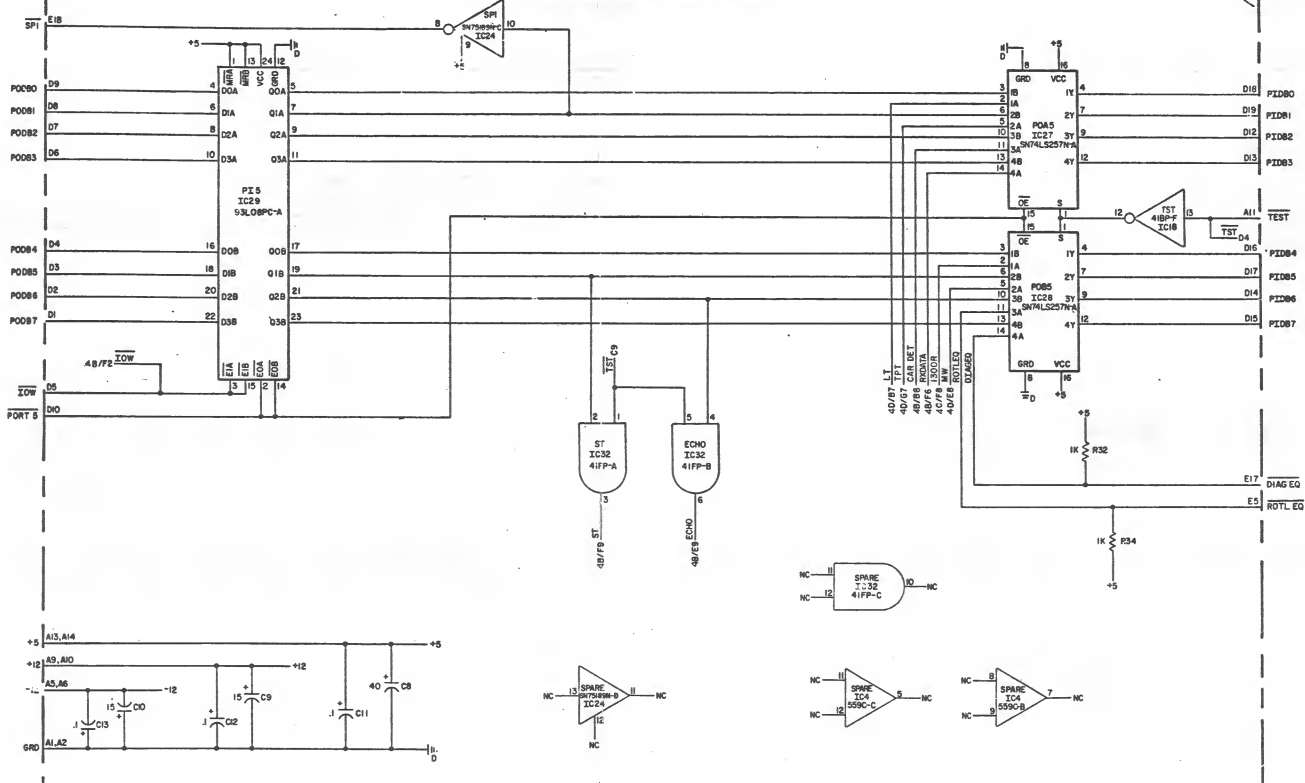
65

PRINTED IN U.S.A.

P/O CPS I2

DATA PORT AND TONE DETECTORS

PORT 5 INPUT / OUTPUT STEERING AND LATCH CIRCUIT

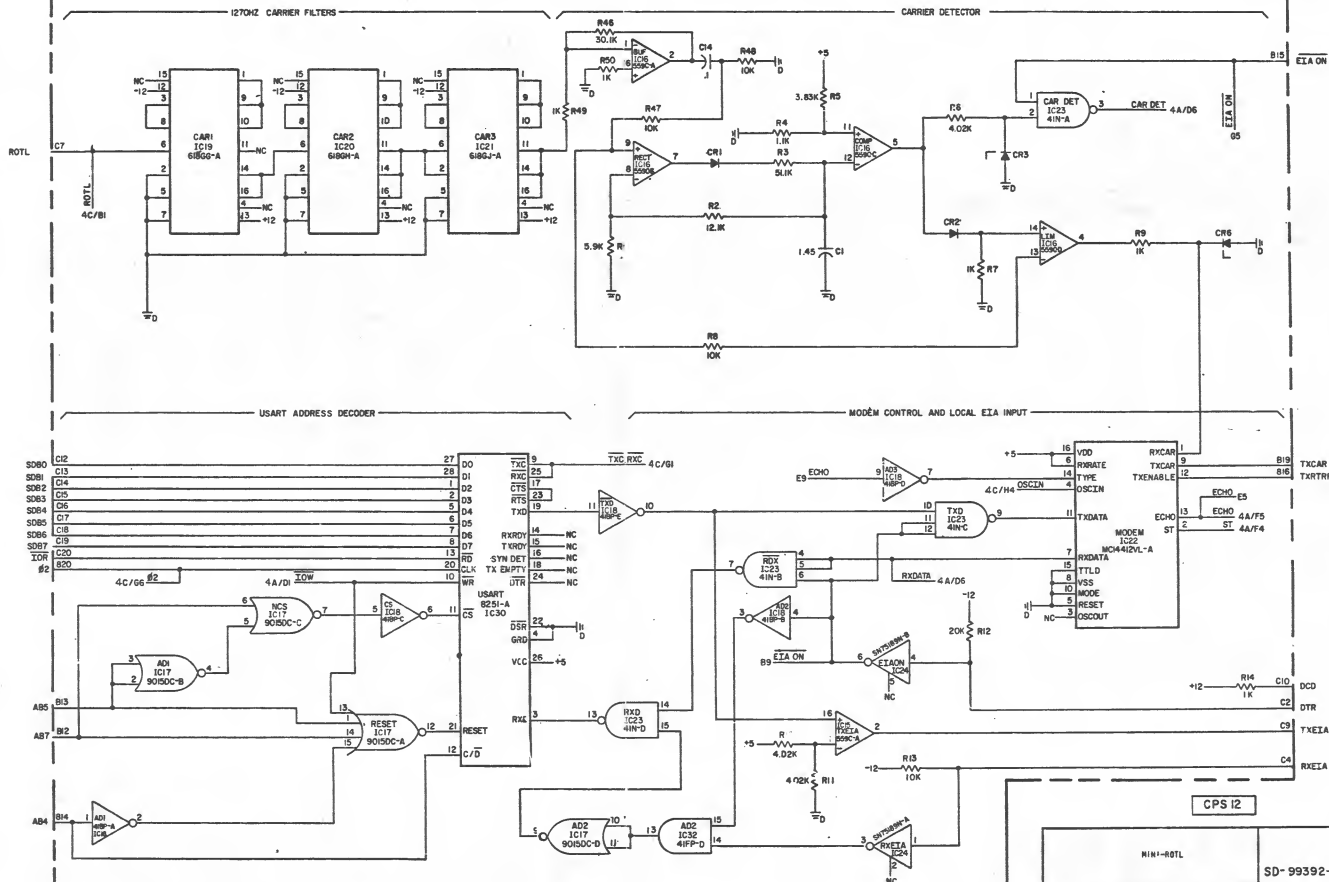


CPS I2

SD-99392-01-J4A

P/O CPS 12

DATA PORT AND TONE DETECTORS



CPS 12

ISSUE

1

MINI-ROTL

BELL TELEPHONE LABORATORIES

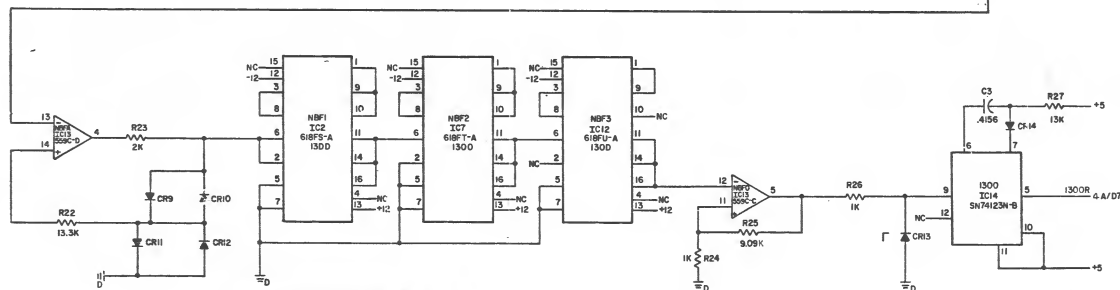
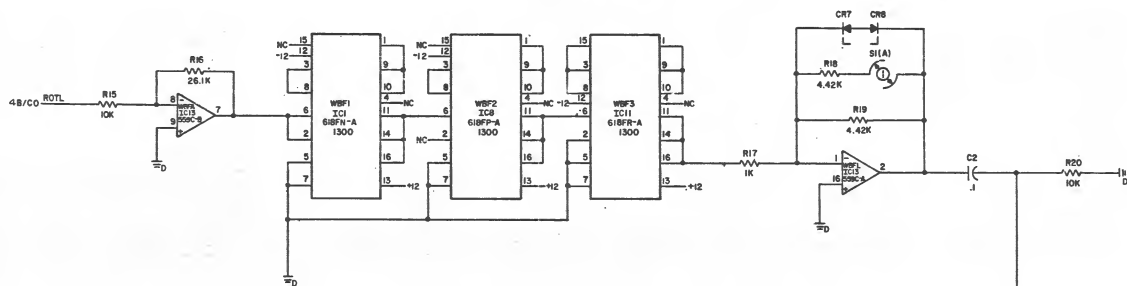
68

SD-99392-01-J4B

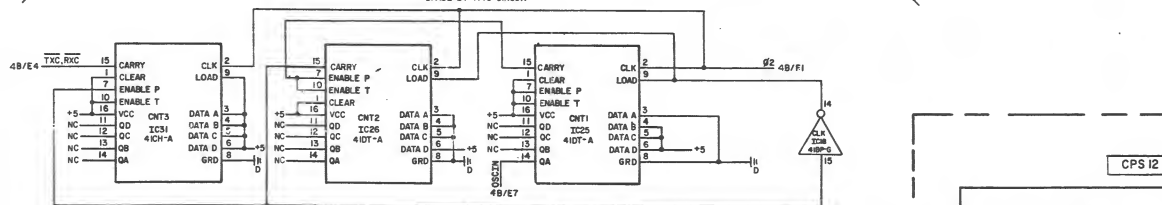
P/O CPS 12

DATA PORT AND TONE DETECTORS

1300 HZ DETECTOR



DIVIDE BY 1440 CIRCUIT



CPS 12

MINI-ROTL

BELL TELEPHONE LABORATORIES

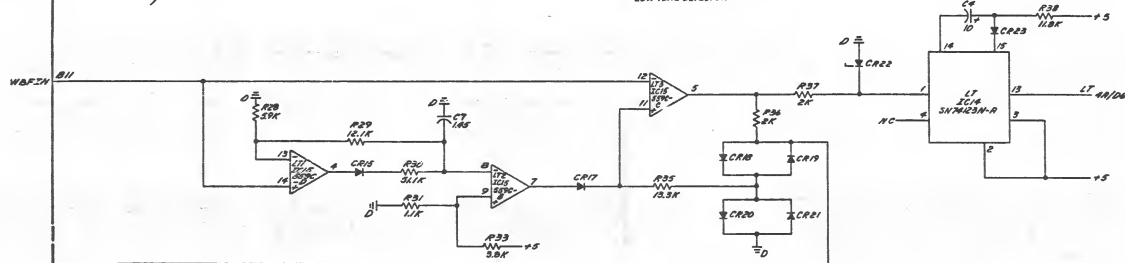
SD-99392-01-J4C

REVISION 65

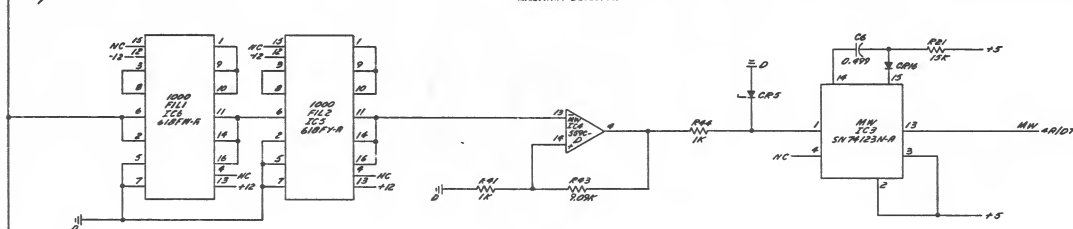
P/O CPS12

DATA PORT AND TONE DETECTORS

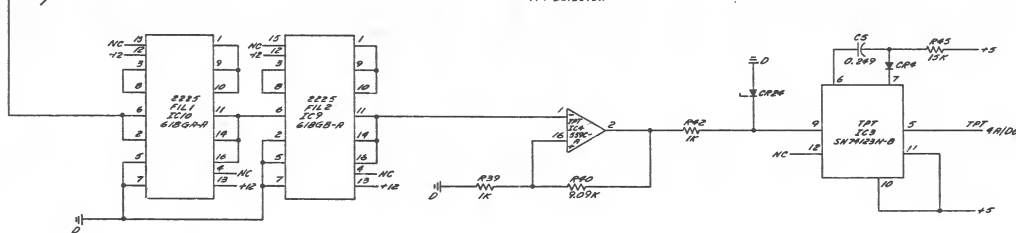
LOW TONE DETECTOR



MILLIWATT DETECTOR



TPF DETECTOR



CPS12

MINI-ROT		DWG. SIZE	ISSUE
		AS	2A
BELL LABORATORIES		SD-99392-01	
		J4D	

P/O CPS 12

DATA PORT AND TONE DETECTORS

COMPONENT LIST

INTEGRATED CIRCUITS

LOC ON CP	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC13	IC14	IC15	LOC ON CP
CODE	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	CODE
ELEM IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELEM IDENT
A	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	A
B																B
C																C
D																D
E																E
F																F
G																G

LOC ON CP	IC17	IC18	IC19	IC20	IC21	IC22	IC23	IC24	IC25	IC26	IC27	IC28	IC29	IC30	IC31	IC32	LOC ON CP
CODE	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	W618P	CODE
ELEM IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELEM IDENT
A	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	W618P 4C/B3	A
B																	B
C																	C
D																	D
E																	E
F																	F
G																	G

SINGLE ELEMENT IC

CAPACITORS

DESIG	LOC	CODE
C1	4B/05	530C1
C2	4C/07	542AD
C3	4C/08	51K
C4	4D/07	530C1
C5	4D/07	530C1
C6	4D/07	530C1
C7	4D/07	530C1
C8	4A/02	602A
C9	4A/02	602A
C10	4A/01	602B
C11	4A/02	602A
C12	4A/01	602B
C13	4A/02	602A
C14	4A/02	602A

DIODES (CONT)

DESIG	LOC	CODE
CR18	4D/05	4080
CR19	4D/05	4080
CR20	4D/05	4080
CR21	4D/05	4080
CR22	4D/05	4080
CR23	4D/05	4080
CR24	4D/05	4080

RESISTORS (CONT)

DESIG	LOC	CODE
R26	4C/07	5.8K
R27	4C/08	5.8K
R28	4D/01	12.1K
R29	4D/02	5.1K
R30	4D/03	5.1K
R31	4D/03	5.1K
R32	4D/03	5.1K
R33	4D/03	5.1K
R34	4D/03	5.1K
R35	4D/03	5.1K
R36	4D/03	5.1K
R37	4D/03	5.1K
R38	4D/03	5.1K
R39	4D/03	5.1K
R40	4D/03	5.1K
R41	4D/03	5.1K
R42	4D/03	5.1K
R43	4D/03	5.1K
R44	4D/03	5.1K
R45	4D/03	5.1K
R46	4D/03	5.1K
R47	4D/03	5.1K
R48	4D/03	5.1K
R49	4D/03	5.1K
R50	4D/03	5.1K

NS-20616, LIA

B-305-C37

SEE NOTE 3 NS-19774, L2, O1
ON SHEET
J4 E

RESISTORS

DESIG	LOC	CODE
R1	4B/04	5.8K
R2	4B/05	12.1K
R3	4B/05	5.1K
R4	4B/05	5.1K
R5	4B/05	5.1K
R6	4B/05	5.1K
R7	4B/05	5.1K
R8	4B/05	5.1K
R9	4B/05	5.1K
R10	4B/05	5.1K
R11	4B/05	5.1K
R12	4B/05	5.1K
R13	4B/05	5.1K
R14	4B/05	5.1K
R15	4B/05	5.1K
R16	4B/05	5.1K
R17	4B/05	5.1K
R18	4B/05	5.1K
R19	4B/05	5.1K
R20	4B/05	5.1K
R21	4B/05	5.1K
R22	4B/05	5.1K
R23	4B/05	5.1K
R24	4B/05	5.1K
R25	4B/05	5.1K

NS-20616, LIA

DIODES

DESIG	LOC	CODE
CR1	4B/05	4080
CR2	4B/05	4080
CR3	4B/05	4080
CR4	4B/05	4080
CR5	4B/05	4080
CR6	4B/05	4080
CR7	4B/05	4080
CR8	4B/05	4080
CR9	4B/05	4080
CR10	4B/05	4080
CR11	4B/05	4080
CR12	4B/05	4080
CR13	4B/05	4080
CR14	4B/05	4080
CR15	4B/05	4080
CR16	4B/05	4080
CR17	4B/05	4080

NOTES:

1. MAY BE OBTAINED FROM "FAIRCHILD" OR EQUIVALENT.
2. ALL MC CODES MAY BE OBTAINED FROM "MOTOROLA" OR EQUIVALENT.
3. ALL SN CODES MAY BE OBTAINED FROM "TEXAS INSTRUMENTS" OR EQUIVALENT.
4. MAY BE OBTAINED FROM "INTEL" OR EQUIVALENT.

CPS 12

MINI-ROT

2

SD-99392-01-J4E

BELL TELEPHONE LABORATORIES

6S

JAN 1974

P/O CPS 12 DATA PORT AND TONE DETECTORS

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.
2. $\downarrow$ GROUND RETURN.
3. DESIGNATED BATTERY AND GROUND RETURN
TERMS FOR ICs.

IC	CODE	LOC	+5V ON TERM.	+12V ON TERM.	-12V ON TERM.	GRD ON TERM.	BY PASS CAP TO GRD
WBF1 68FN	IC1		13		12	5,7	
WBF1 68FN	IC2		13		12		
SN74123N	IC3	23XQU18				8	C20
559C	IC4		3,6	10,5			C25
559C	IC4						C26
559C	IC5		13		12	2,5,7	
559C	IC6		13		12	5,7	
WBF2 68FP	IC7		13		12		
WBF2 68FP	IC8		13		12		
WBF2 68FP	IC9		13		12	2,5,7	
WBF2 68FP	IC10		13		12	5,7	
WBF3 68FR	IC11		13		12	2,5,7	
WBF3 68FR	IC12		13		12	5,7	
559C	IC13		3				C16
559C	IC13		6		10		C15
SN74123N	IC14	23XQU18				18	C21
559C	IC15		3				C27
559C	IC15		6		10		
559C	IC16		3		15		C28
559C	IC16		6		10		C23
90150C	IC17	16			15		C22
41BP	IC18	16				8	C10
CAR1 61856	IC19		13		12		
CAR2 6185H	IC20		13		12	5,7	
CAR3 6185J	IC21		13		12		
MC1412VL	IC22	16				8	C24
41N	IC23	16					C32
SN7389N	IC24	16				7	C31
41OT	IC25	16					C33
SN74LS257N	IC27	16				8	C34
93LO8PC	IC28	13,24				12	C18
6251	IC30	26				4	C19
41CH	IC31	16				8	C35
41FP	IC32	16					C14

MANUFACTURING REFERENCES

CATEGORY	NO.
CONTROLLING DRAWING	SD-35045-01
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-35131-()
CONNECTOR ON FRAME	

SIMBOL
SEE SHEET J46

CIRCUIT DESCRIPTION
SEE CD-35046-01.

INPUT/OUTPUT INFORMATION
SEE NOTE 302

CPS 12

ISSUE
2A

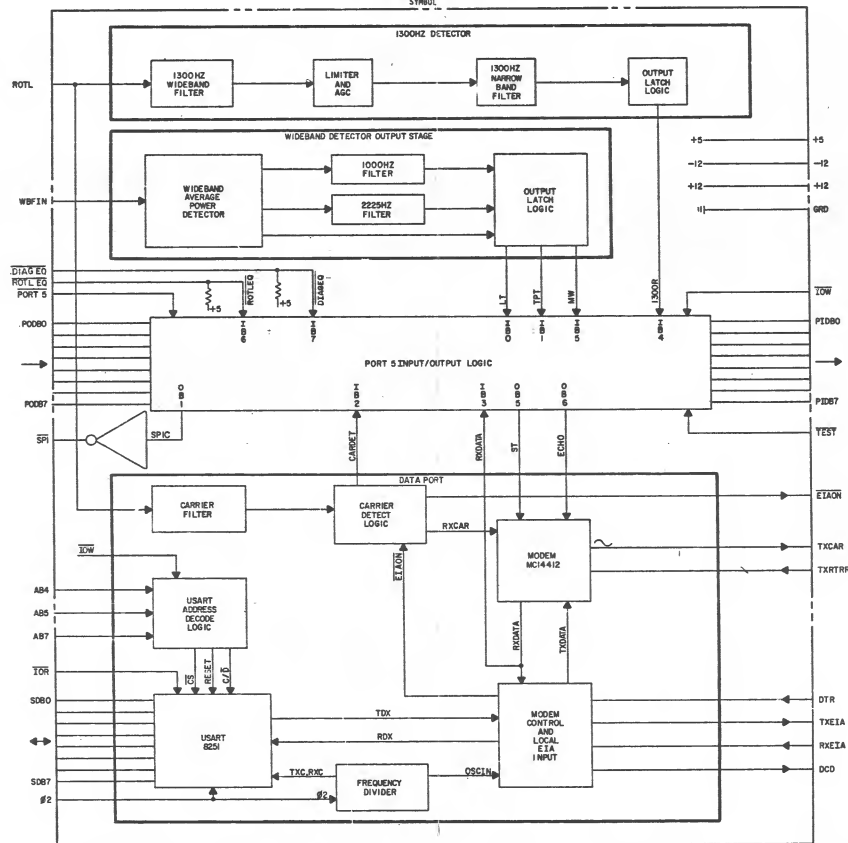
NINI-ROTL

SD-99392-01-J4F

BELL TELEPHONE LABORATORIES

65

P/O CPS 12 DATA PORT AND TONE DETECTORS SYMBOL



P/O CPS 12

KIRI-ROTL

2

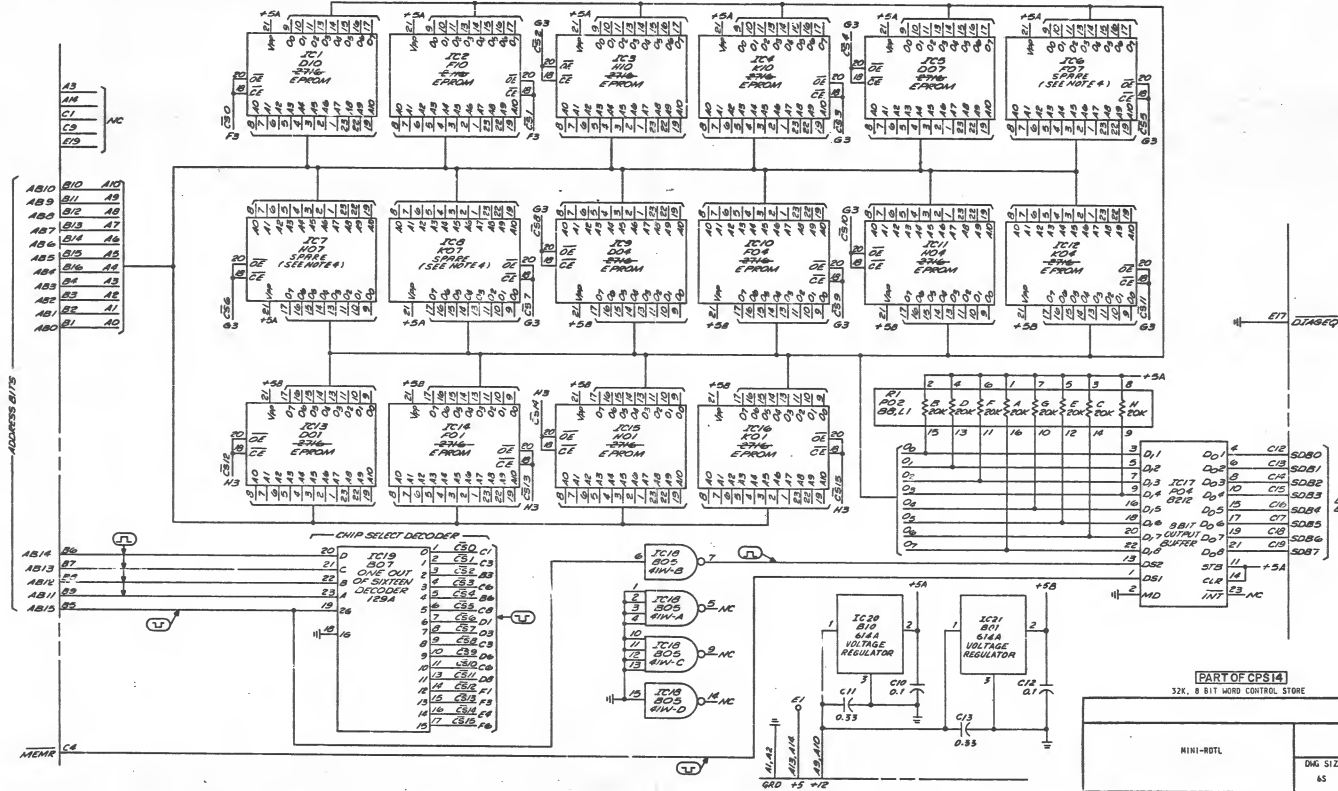
SD-99392-01-J46

BELL TELEPHONE LABORATORIES

6S

2A

PART OF CPS 14 32K, 8 BIT WORD CONTROL STORE



PART OF CPS 14

32K, 8 BIT WORD CONTROL STORE

MINI-BTL

DWG SIZE

1500

38

BELL LABORATORIES

8D-99392-01-

J5A

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COMPONENT LIST

INTEGRATED CIRCUIT

LOC ON CP	IC18 B05	IC19 B07	IC19F D01	IC99 D04	IC99 D07	IC19 D10	IC19F F01	IC109 F04	IC6 F07	IC29 F10	IC159 H01	IC119 H04	IC7 H07	IC39 H10	LOC ON CP
CODE	41A 41A MECO	129A 129A MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	CODE
ELEM IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELEM IDENT
A	5A/24		5A/22	5A/22	5A/24	5A/24	5A/22	5A/23	5A/25	5A/27	5A/25	5A/24	5A/26	5A/22	5A/24
B	5A/24														B
C	5A/24														C
D	5A/24														D
E															E
F															F
BYPASS CAP.			C1			C2		C3			C4	C5		C6	BYPASS CAP.

LOC ON CP	IC16 K01	IC129 K04	IC8 K07	IC44 K10	IC17 P05	IC30 B10	IC21 B01	LOC ON CP
CODE	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	229A-1 229A-1 MECO	CODE
ELEM IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELEM IDENT
A	5A/25	5A/27	5A/23	5A/25	5A/28	5A/26	5A/27	A
B								B
C								C
D								D
E								E
F								F
BYPASS CAP.	C7			C8	C9			BYPASS CAP.

A SINGLE ELEMENT IC
F SEE NOTE 4

CAPACITOR

DESIG	CODE
[9] C1-C9	KS-19774, L7, 0.01
C10, C12	KS-20736, L4, 0.1
C11, C13	KS-19774, L5, 0.33

NETWORK, RESISTOR

REF DESIG	R1
LOC ON CP	P02
DESIG	85, L1
CODE	KS-21754, L1, 20K
ELEM IDENT	DESIG LOC
A	1.1A 5A/27
B	2.1A 5A/26
C	3.1A 5A/27
D	4.1A 5A/26
E	5.1A 5A/27
F	6.1A 5A/27
G	7.1A 5A/27
H	8.9 5A/28

PART OF CPS14

32K, 8 BIT WORD CONTROL STORE

CIRCUIT DESCRIPTION

SEE CO-99392-02

INPUT/OUTPUT INFORMATION

SEE CO-99392-01

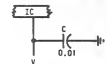
NOTES: (CONT)

- IC1 THROUGH IC5 PROGRAMMED PER 3 ESS ROTL RUNNING PROGRAM PR-35096A, ISSUE 3. IC9 THROUGH IC14 PROGRAMMED PER 3 ESS ROTL DIAGNOSTIC PROGRAM PR-350965, ISSUE 3. PR-350965 AND PR-350966 HAVE NOT BEEN ISSUED. SOCKETS ARE PROVIDED FOR IC5, IC7, AND IC8 FOR POSSIBLE FUTURE USE IN THE 3 ESS ROTL RUNNING PROGRAM PR-35096A.

NOTES:

- UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
INDUCTANCE VALUES ARE IN MICROHENRIES,
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.
- GROUND TERMIN.
- DESIGNATED BATTERY AND RETURN TERM. FOR IC15:

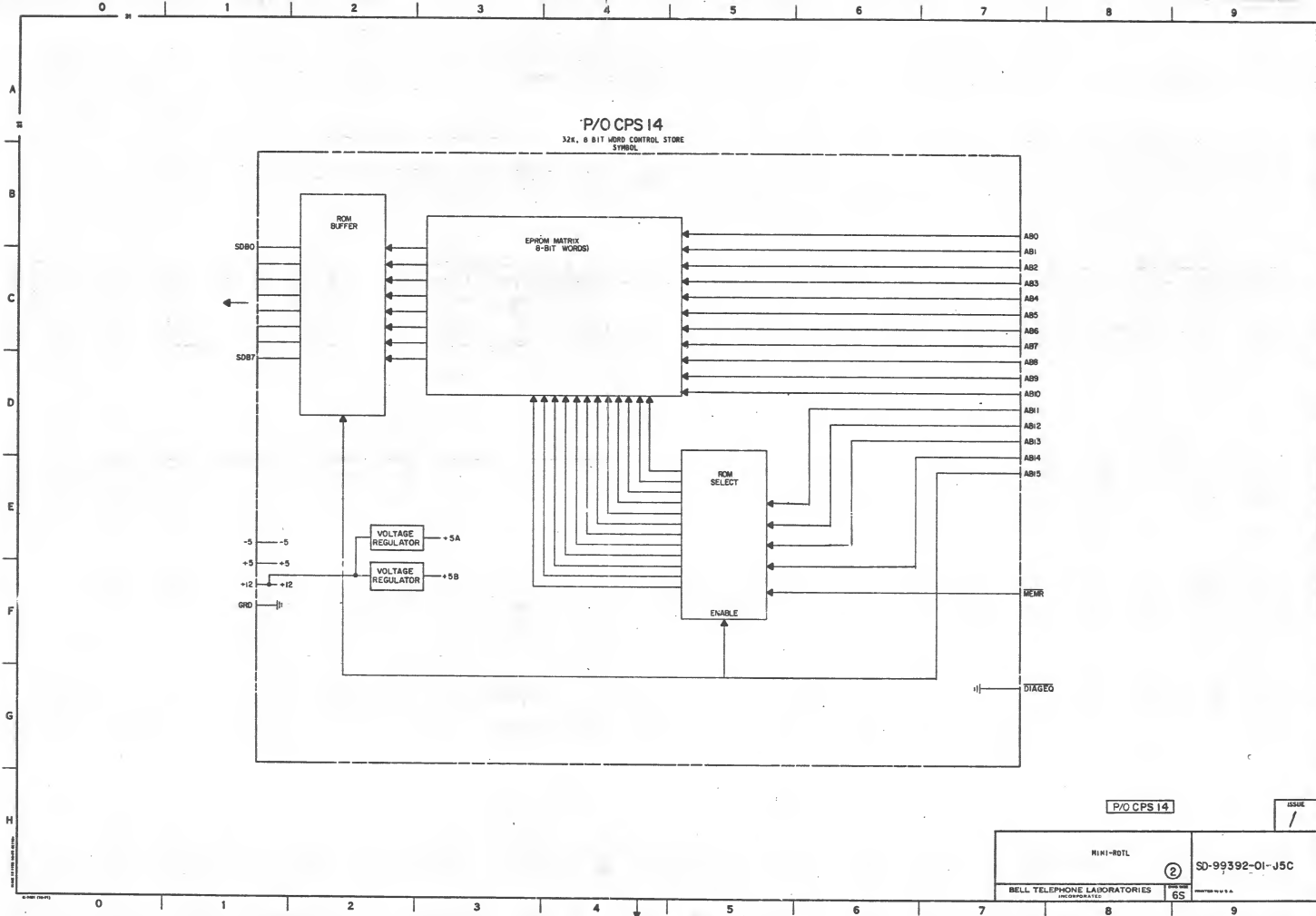
IC	IC	+5A ON TERM.	+5B ON TERM.
CODE	LOC	ON TERM.	ON TERM.
41A	IC18	16	8
129A	IC19	12	
	IC1		
	IC2		
	IC3		
	IC4		
	IC5		
	IC9		
	IC10		
	IC11		
	IC12		
	IC13		
	IC14		
	IC15		
	IC16		
	IC17	24	12

A BYPASS CAPACITOR IS SPECIFIED ON THE
COMPONENT LIST TABLE FOR AN IC. CONNECT BETWEEN
THIS TERMINAL AND GROUND AS SHOWN BELOW.

PART OF CPS14

32K, 8 BIT WORD CONTROL STORE

MINI-ROTL	DWG SIZE KS	ISSUE 44
BELL LABORATORIES	SD-99392-01	J5B



P/O CPS 14

ISSUE
/

NIKI-ROTL

②

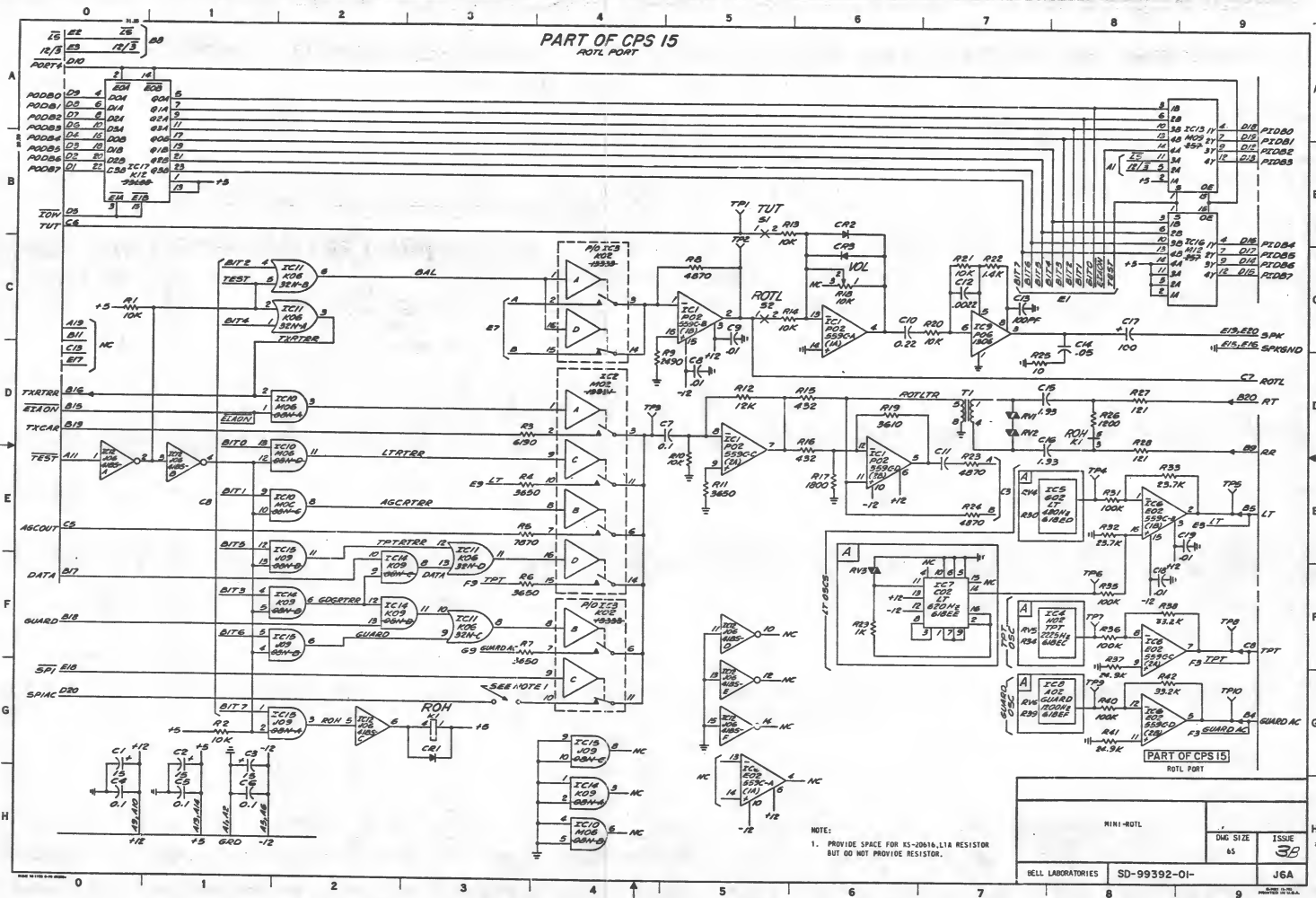
SD-99392-01-J5C

BELL TELEPHONE LABORATORIES

65

PRINTED IN U.S.A.

PART OF CPS 15
ROT4 PORT



NOTE:

1. PROVIDE SPACE FOR KS-20616, L1A RESISTOR
BUT DO NOT PROVIDE RESISTOR.

MINI-ROT			
		DWG SIZE 65	ISSUE 38
BELL LABORATORIES	SD-99392-01-		J6A

ROTL, PORT



DWG SIZE	
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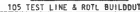
DWG SIZE	
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ISSUE

SD-99392-01-

J6C

103 TEST LINE & ROTL BUILDOUT



COMPONENT LIST INTEGRATED CIRCUIT

LOC ON CP	IC1 L01	IC7 L08	IC2 L05	IC5 L09	IC3 L03	IC8 R08	IC4 R07	IC6 R04	IC9 R11	LOC ON CP
CODE	41BS, MECO	41BS, MECO	41EN, MECO	41EN, MECO	559C, MECO	559C, MECO	559C, MECO	559C, MECO	559C, MECO	CODE
ALPH IDENT	DESIG	DESIG	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC
A	7A/00	7A/03	7A/03	7A/03	7A/07	7A/07	7A/03	7A/03	7A/03	A
B	7A/01	7A/03	7A/03	7A/03	7A/07	7A/07	7A/03	7A/03	7A/03	B
C	7A/03	7A/03	7A/03	7A/03	7A/07	7A/07	7A/03	7A/03	7A/03	C
D	7A/03	7A/03	7A/03	7A/03	7A/07	7A/07	7A/03	7A/03	7A/03	D
E	7A/03	7A/03	7A/03	7A/03	7A/07	7A/07	7A/03	7A/03	7A/03	E
F	7A/03	7A/03	7A/03	7A/03	7A/07	7A/07	7A/03	7A/03	7A/03	F
BYPASS CAP.		C15	C16				C17		C18	BYPASS CAP.

8 SINGLE ELEMENT IC

RELAY



REF DESIG	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10
FUNC DESIG	MB3	LCKY	LCKTA	LCKTB	PG	TCA	TCB	TC5	TTA	TTB
CODE	345B, 345B, 345B, 345B, 345B, 345B, 345B, 345B, 345B, 345B									
OPTION	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC
3	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01
4	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01
5	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01
6	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01
7	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01
8	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01
9	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01
10	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01	7A/01



REF DESIG	K11	K12	K13	K14	K15
FUNC DESIG	CONA	CONB	CONC	COND	HEBA
CODE	337A, 337A, 337A, 337A, 337A				
OPTION	LOC	LOC	LOC	LOC	LOC
3	7A/08	7A/08	7A/08	7A/08	7A/08
4	7A/08	7A/08	7A/08	7A/08	7A/08
5	7A/08	7A/08	7A/08	7A/08	7A/08
6	7A/08	7A/08	7A/08	7A/08	7A/08
7	7A/08	7A/08	7A/08	7A/08	7A/08
8	7A/08	7A/08	7A/08	7A/08	7A/08
9	7A/08	7A/08	7A/08	7A/08	7A/08
10	7A/08	7A/08	7A/08	7A/08	7A/08

CAPACITOR

DESIG	CODE
[2] C1, C2	559AB, 0.1
[2] C3, C4	K5-49774, L2, .01
[4] C5-C8	K5-20736, L1, 1
[3] C9-C11	K5-49774, L5, 0.1
[3] C12-C14	402F
[4] C15-C18	K5-49774, L2, .01

DIOIDE

DESIG	CODE
[8] CR1-CR8	459C

POTENTIOMETER

DESIG	CODE
[3] R2, R12, R19	K5-19646, L3, 100

RESISTOR

DESIG	CODE
R1	K5-20616, L1A, 10C
R3	K5-20289, LAC, 1.4K
R4	K5-20616, L1A, 24P
R5	K5-20616, L1A, 47C
R6	K5-20616, L1A, 24P
R7	K5-20616, L1A, 1K
R8	K5-20616, L1A, 10K
R9	K5-20616, L1A, 133A
R10	K5-20616, L1A, 10K
R11	K5-20616, L1A, 1K
R14	K5-20616, L1A, 1K
R15	K5-20616, L1A, 10K
R16	K5-20616, L1A, 133K
R17	K5-20616, L1A, 10K
R18	K5-20616, L1A, 1K
R21	K5-20616, L1A, 10K

VARIATOR

DESIG	CODE
[2] RV1, RV2	105A

PART OF CPS16 16- TEST LINE & ROTL BUILDOUT

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	CO-2C552-C (3)
CONNECTOR ON FRAME	

SYMBOL
SEE SHEET J7C

NOTES:

- UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
INDUCTANCE VALUES ARE IN MICROHENRIES.
VALUES PRECEDED BY THE SYMBOL "K" (PLUS)
OR "M" (MINUS) ARE IN VOLTS.
- GROUND RETURN.
- BATTERY AND GROUND TERMINATIONS FOR IC'S:

IC NR CODE	+5 BAT. TERM.	+12 BAT. TERM.	-12 BAT. TERM.	GRD TERM.	TERM.	TERM.
41BS	16			7, 8		
41EN	16			7, 8		
559C				8		
4033P K5-21285, L4	16					
559C						
4033P K5-22116, L1		12	5	4		
4033P K5-21284, L12	24			12		

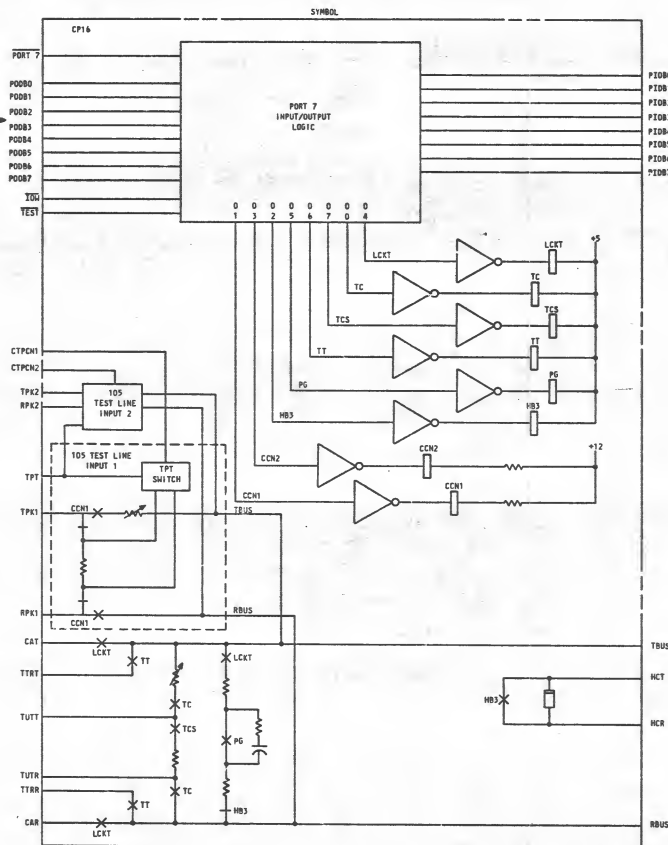
WHEN A BYPASS CAPACITOR IS SPECIFIED IN THE COMPONENT LIST
TABLE FOR AN IC, CONNECT BETWEEN THIS TERMINAL AND GROUND,
AS SHOWN BELOW.



PART OF CPS16 105 TEST LINE & ROTL BUILDOUT

MINI-ROTL	DWG SIZE 65	ISSUE 3B
BELL LABORATORIES	SD-99392-01-	J7B

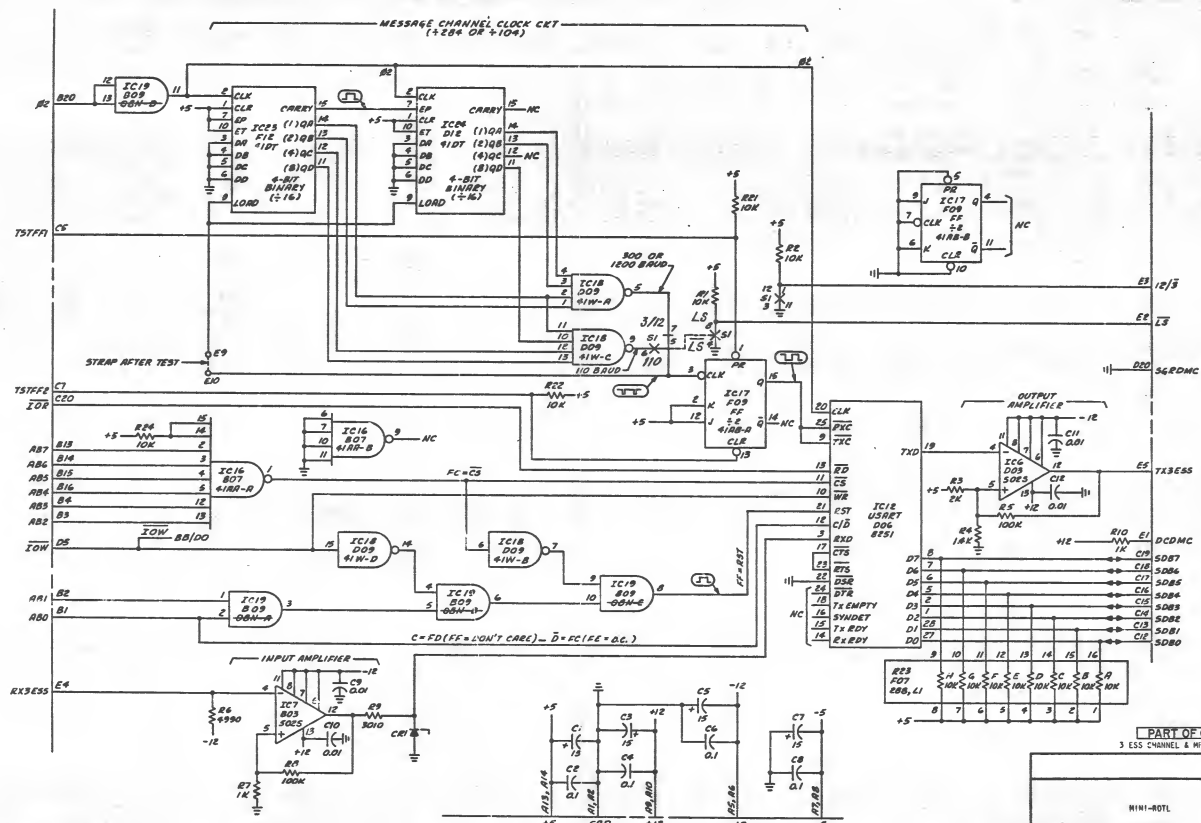
PART OF CPS 16 105 TEST LINE & ROTL BUILDOUT



PART OF CPS 16
105 TEST LINE & ROTL BUILDOUT

105 TEST CYCLE & ROTL BUTTON			
MINI-ROTL		DWG SIZE A5	ISSUE /
BELL LABORATORIES	SD-99392-01-		J7C

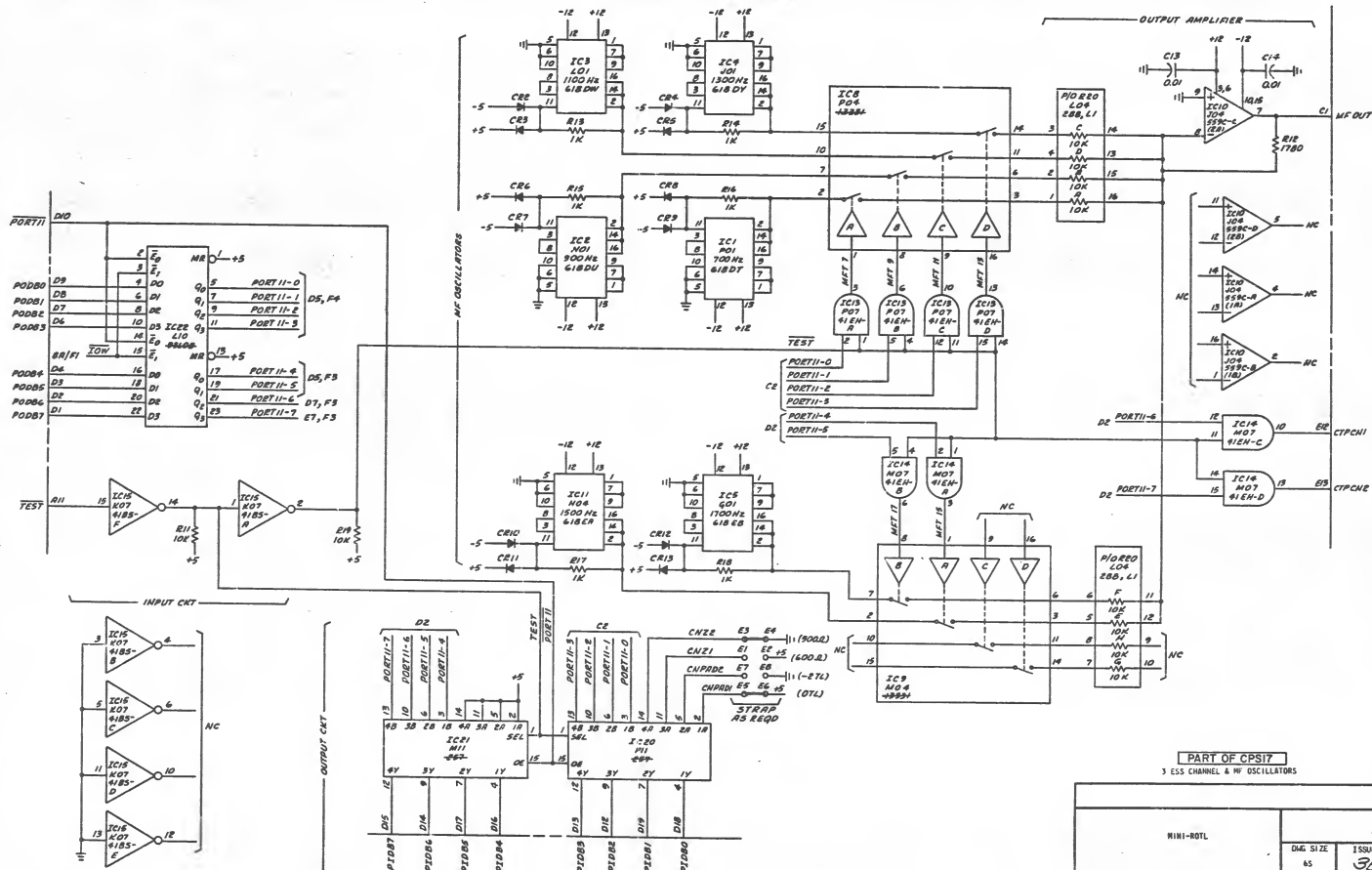
PART OF CPS 17
3 ESS CHANNEL & MF OSCILLATORS



PART OF CPS17
3 ESS CHANNEL & MF OSCILLATORS

MINI-ROTL		DWG SIZE 45	ISSUE 38
BELL LABORATORIES		SD-99392-01-	J8A

PART OF CPS 17 3 ESS CHANNEL & MF OSCILLATORS



PART OF CPS17
3 ESS CHANNEL & MF OSCILLATORS

MINI-ROT		DWG. SIZE	ISSUE
		AS	33
BELL LABORATORIES	SD-99392-01-		J88

COMPONENT LIST

PART OF CPS 17

3 ESS CHANNEL & RF OSCILLATORS

INTEGRATED CIRCUIT

LOC ON CP	IC18 509	IC16 807	IC17 709	IC15 807	IC24 712	IC23 712	IC14 707	IC13 707	IC10 704	IC1 701	IC2 701	IC3 701	LOC ON CP
CODE	41W	41A	41B	41B	41D18	41D18	41E	41E	59AC	41B07 R	41B07 R	41B07 R	CODE
ELER IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELER IDENT
A	BA/4	BA/2	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	A
B	BA/4	BA/2	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	B
C	BA/4	BA/2	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	C
D	BA/4	BA/2	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	D
E	BA/4	BA/2	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	E
F	BA/4	BA/2	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	F
BYPASS CAP	C15	C16	C17	C18	-	-	-	C19	-	-	-	C22	BYPASS CAP

MANUFACTURING REFERENCES

CATEL. RY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	EO-26593-1
CONNECTOR ON FRAME	

SYMBOL

SEE SHEET J00

LOC ON CP	IC4 701	IC11 701	IC5 701	IC19 701	IC21 701	IC20 701	IC7 701	IC4 701	IC12 701	IC9 701	IC8 701	IC22 701	LOC ON CP
CODE	41B07 R	41B07 R	41B07 R	41B07 R	41B07 R	41B07 R	41B07 R	41B07 R	41B07 R	41B07 R	41B07 R	41B07 R	CODE
ELER IDENT	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	DESIG LOC	ELER IDENT
A	BA/25	BA/4	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	A
B	BA/25	BA/4	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	B
C	BA/25	BA/4	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	C
D	BA/25	BA/4	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	D
E	BA/25	BA/4	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	E
F	BA/25	BA/4	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	BA/5	F
BYPASS CAP	-	-	C23	C24	C25	-	-	C26	C27	C28	C29	-	BYPASS CAP

R SINGLE ELEMENT IC

CAPACITOR

DESIG	CODE
C1	602F
C2	KS-19774, L13, 0.1
C3	602F
C4	KS-19774, L13, 0.1
C5	602F
C6	KS-19774, L13, 0.1
C7	602F
C8	KS-19774, L13, 0.1
[21] C9-C29	KS-19774, L2, 0.01

DIODE

DESIG	CODE
CR1	800B
[12] CR2-CR13	450C

RESISTOR

DESIG	CODE
[2] R1, R2	KS-20616, L14, 10K
R3	KS-20616, L14, 2K
R4	KS-20616, L14, 1.2K
R5	KS-20616, L14, 100K
R6	KS-20616, L14, 4990
R7	KS-20616, L14, 1K
R8	KS-20616, L14, 100K
R9	KS-20616, L14, 5010
R10	KS-20616, L14, 1K
R11	KS-20616, L14, 10K
R12	KS-20616, L14, 1780
[4] R13-R18	KS-206-n, L14, 1K
R19	KS-20616, L14, 10K
[3] R21, R22, R24	KS-20616, L14, 10K

RESISTOR NETWORK

LOC ON CP	R23	R10
DESIG	80, L1	80, L1
CODE	KS-21288, L1	KS-21288, L1
ELER IDENT	DESIG LOC	DESIG LOC
A	3.1K	BA/5
B	2.15	BA/5
C	3.14	BA/5
D	4.13	BA/5
E	5.12	BA/5
F	6.11	BA/5
G	7.10	BA/5
H	8.1	BA/5
BYPASS CAP.	C20	

SWITCH

DESIG	CODE
S1	74002, GRAYHILL, INC.

CIRCUIT DESCRIPTION

SEE CD-99392-01

INPUT/OUTPUT INFORMATION

SEE CD-99392-01

1. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS
CAPACITANCE VALUES ARE IN MICROFARADS
INDUCTANCE VALUES ARE IN MICROHENRIES
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS
2. GROUND RETURN.
3. BATTERY AND GROUND TERMINATIONS FOR JCS.

IC R# CODE	+5 TERM.	+12 TERM.	-12 TERM.	GRD TERM.	TERM.	TERM.
41W	16			8		
41A	16			8		
41B	16			7, 8		
41C	16			7, 8		
41D	16			7, 8		
KS-21736, L35	14			7		
450C	16			8		
KS-21285, L1	16			8		
450C	20			4		
KS-21921, L1	12	5		4		
KS-22116, L1	12	5		4		
450C	24			12		
KS-21284, L12	24			12		

XX WHEN A BYPASS CAPACITOR IS SPECIFIED ON THE COMPONENT LIST TABLE FOR AN IC, CONNECT BETWEEN THIS TERMINAL AND GROUND, AS SHOWN BELOW.



PART OF CPS17

3 ESS CHANNEL & RF OSCILLATORS

MIRI-ROTL

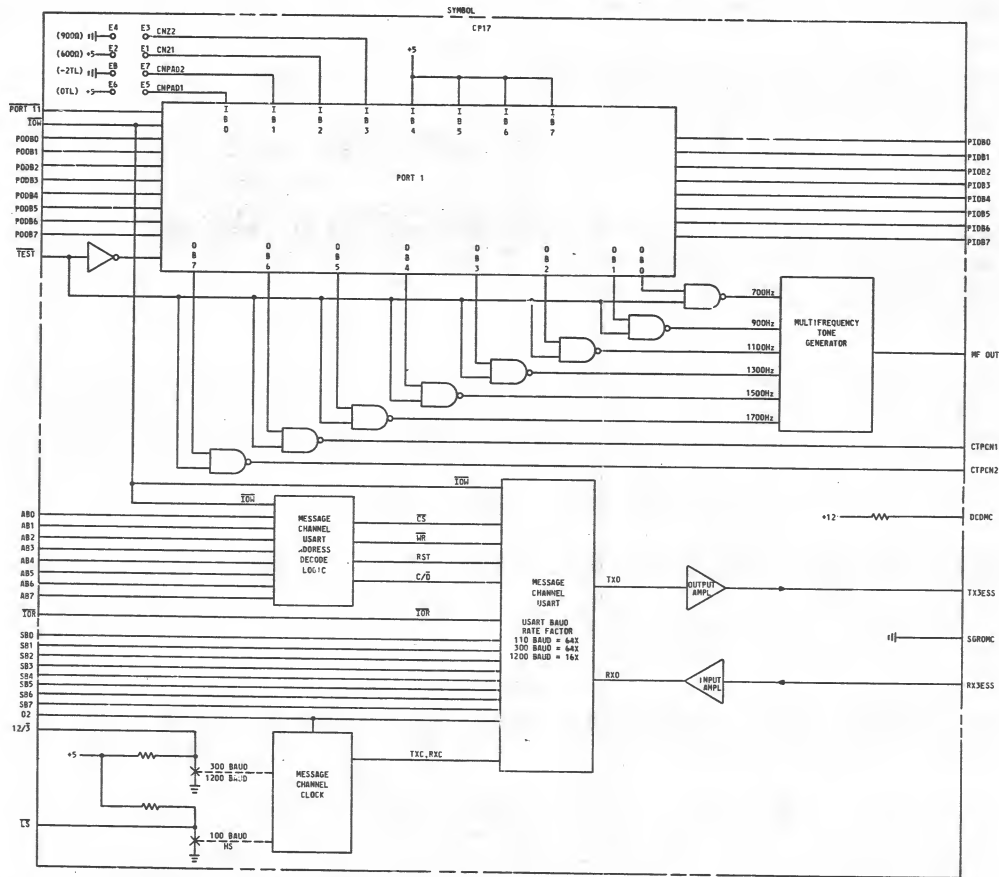
BELL TELEPHONE LABORATORIES

6S

SD-99392-01-J8C

33

PART OF CPS 17 3 ESS CHANNEL & RF OSCILLATORS



MESSAGE CHANNEL CLOCK INFORMATION

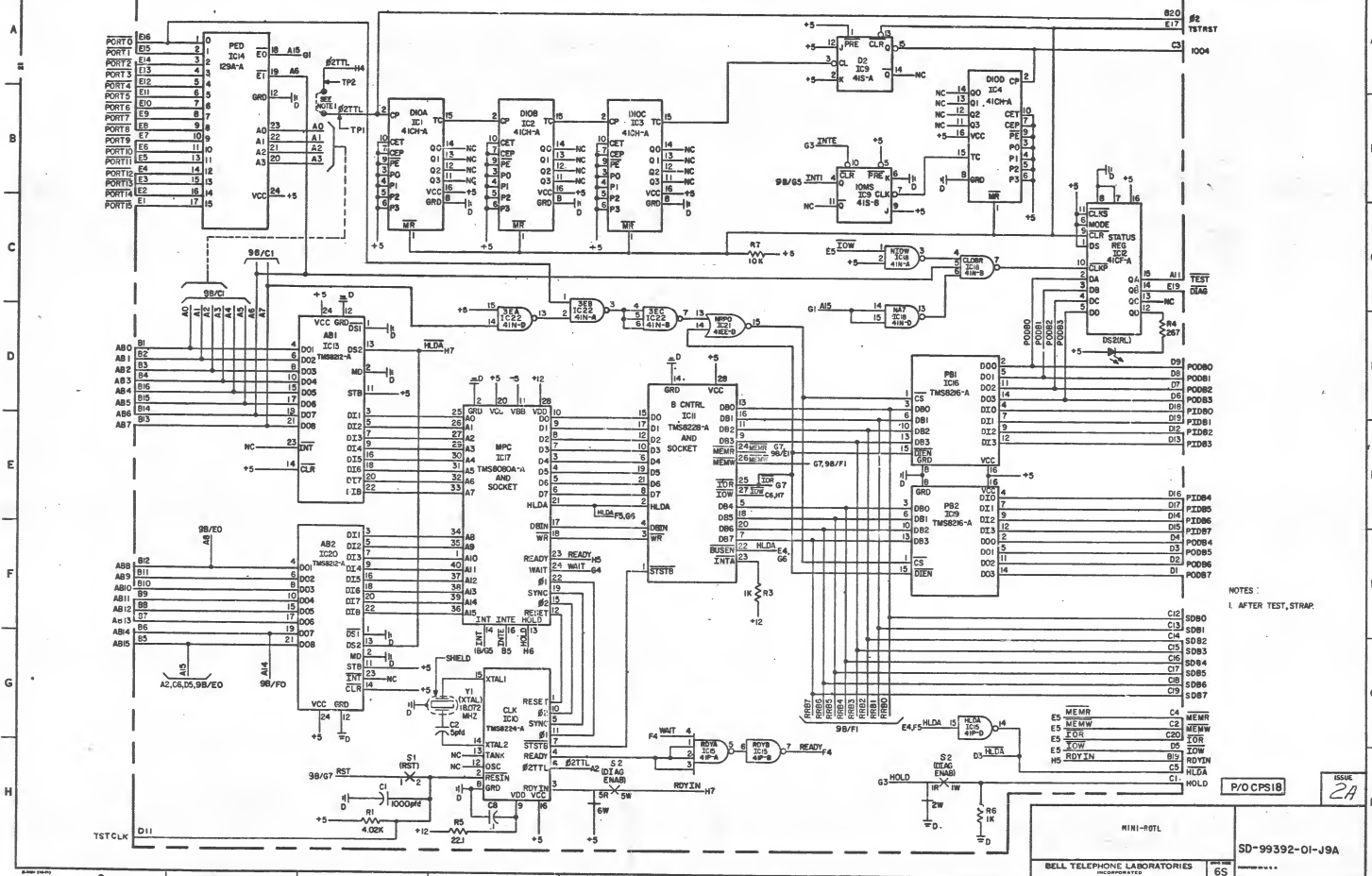
3X16 = 48 #2 PULSES
1 #2 PULSES
1 #2 PULSE TO LOAD ZEROS.
57 #2 PULSES x 2 (+2 F/F) = 104
8X16 = 128 #2 PULSES
13 #2 PULSES
1 #2 PULSE TO LOAD ZEROS
162 #2 PULSES x 2 (+2 F/F) = 264
#2 = 2 MHz
#2+264 = 7.04 KHZ = 110 BAUD WITH LS = 0
#2+104 = 19.2 KHZ = 300 BAUD WITH LS = 1, 12/5 = 0
#2+104 = 19.2 KHZ = 1200 BAUD WITH LS = 1, 12/5 = 0

PART OF CPS 17

3 ESS CHANNEL & RF OSCILLATORS

MINI-ROT		DWG SIZE	ISSUE
		45	/
BELL LABORATORIES	SD-99392-01-	J8D	

CENTRAL PROCESSING UNIT (CPU)



NOTES :
1. AFTER TEST, STRAP.

P/O CPS18

SD-99392-01-J9A

BELL TELEPHONE LABORATORIES
INCORPORATED

65

ISSUE
2A

ISSUE
2A

BELL TELEPHONE LABORATORIES
INCORPORATED

SD- 99392-01-J9B

P/O CPS 18

COMPONENT LIST

INTEGRATED CIRCUITS

CENTRAL PROCESSING UNIT (CPU)

SEE NOTE 1

LOC ON CP	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC13	IC14	LOC ON CP
CODE	#41CH	#41CH	#41CH	#41CH	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	CODE
ELEM IDENT	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC	ELEM IDENT
A	D10	9A/82	D09	9A/83	D10C	9A/84	D10D	9A/85	D10E	9A/86	D10F	9A/87	D10G	9A/88	A
B															B
C															C
D															D
E															E
F															F
G															G
BYPASS CAP	C10		C15		C16		C17		C24		C26		C31		BYPASS CAP

LOC ON CP	IC15	IC16	IC17	IC18	IC19	IC20	IC21	IC22
CODE	#41CH	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2	#TMS8042-2
ELEM IDENT	DESIG	LOC	DESIG	LOC	DESIG	LOC	DESIG	LOC
A	RD1A	9A/85	PBI	9A/86	MPC	9A/87	N10W	9A/88
B	RD1B	9A/85	PBI	9A/86	MPC	9A/87	N10W	9A/88
C	RD1C	9A/85	PBI	9A/86	MPC	9A/87	N10W	9A/88
D	RD1D	9A/85	PBI	9A/86	MPC	9A/87	N10W	9A/88
E	RD1E	9A/85	PBI	9A/86	MPC	9A/87	N10W	9A/88
F	RD1F	9A/85	PBI	9A/86	MPC	9A/87	N10W	9A/88
G	RD1G	9A/85	PBI	9A/86	MPC	9A/87	N10W	9A/88
BYPASS CAP	C15		C22		C25,C27		C20	

* SINGLE ELEMENT IC

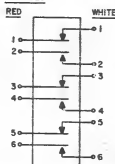
CAPACITORS

DESIG	LOC	CODE
C1	9A/82	K3-20K76, L15, 000UF
C2	9A/83	K3-20K76, L17, 50UF
C3	9B/80	602A
C4	9B/81	602A
C5	9B/81	602F
C6	9B/81	602F
C7	9B/81	602F
C8	9B/81	602F
C9	9B/82	K3-1874, L5, 1

RESISTORS

DESIG	LOC	CODE
R1	9A/82	4.02K
R2	9B/85	274
R3	9A/85	1K
R4	9A/88	267
R5	9A/83	22-1
R6	9A/87	1K
R7	9A/85	10K

SWITCHES



DESIG	LOC
IDENT	(DIAG ENAB)
CODE	7095-006-D12
COLOR	RED WHITE
5	9A/H4 9A/H4
4	9B/H7
3	9B/H7
2	9A/H6
1	9A/H6 9A/H6

(SEE NOTE 3)

DESIG	LOC
IDENT	(RS1)
CODE	39-1 (SEE NOTE 2)
2	9A/H2
1	9A/H2

- NOTES:
1. ALL TMS CODES MAY BE OBTAINED FROM "TEXAS INSTRUMENTS" OR EQUIVALENT.
 2. MAY BE OBTAINED FROM "GRAYHILL" OR EQUIVALENT.
 3. MAY BE OBTAINED FROM "TRW CORPORATION" OR EQUIVALENT.

Q3 Q0-C32 SEE NOTE 3 K3-1974, L7, 01
ON SHEET
J90

CRYSTALS

DESIG	LOC	CODE
(XTAL) Y1	9A/83	106AR16, 072 MHz

DIODES, LIGHT EMITTING

DESIG	LOC	CODE
(DIAG ENAB) DS1	9B/H6	54-3
(RL1) DS2	9A/88	54-1H

P/O CPS 18

ISSUE
2A

MINI-ROTL

2

50-99392-01-J9C

BELL TELEPHONE LABORATORIES

65

JANUARY 1970

P/O CPS 18
CENTRAL PROCESSING UNIT (CPU)

- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.
2. ↓ GROUND RETURN.
3. DESIGNATED BATTERY AND GROUND RETURN
TERMS FOR ICS.

IC	CODE	LOC	+5V ON TERM.	-5V ON TERM.	+12V ON TERM.	GRD ON TERM.	BY PASS CAP. TO GRD
41CH	IC1	16				8	C10
	IC2	16				8	C15
	IC3	16				8	C16
	IC4	16				8	C17
TMS4042-2	IC5	16				8	C24
	IC6	16				8	C28
	IC7	16				8	C28
	IC8	16				8	C31
41S	IC9	16				8	C11
	IC10	16				8	C18
	IC11	28				14	C21
	IC12	16				8	C13
TMS8212	IC13	24				12	C29
	IC14	24				12	C14
	IC15	16				8	C19
	IC16	20				8	C22
TMS8080A	IC17			11		2	C25
	IC18			28		8	C27
41N	IC19	16				8	C20
	IC20	24				12	C30
41E	IC21	16				8	C12
	IC22	16				8	C32

MANUFACTURING REFERENCES

CATEGORY	NO.
CONTROLLING DRAWING	SD-35065-01
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-35140-1
CONNECTOR ON FRAME	

SYMBOL
SEE SHEET 496

CIRCUIT DESCRIPTION
SEE CD-35065-01.

INPUT / OUTPUT INFORMATION
SEE NOTE 302.

P/O CPS 18

ISSUE
2A

MINI-RTL

SD-99392-01-J9D

BELL TELEPHONE LABORATORIES

65

ISSUE
24

②

SD-99392-01- J9E

BELL TELEPHONE LABORATORIES

11

CPS-19 POWER INTERFACE

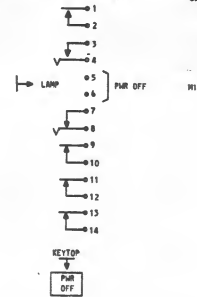
COMPONENT LIST

DIODE, LIGHT EMITTING

REF	DESIG	FUNCTION	CODE
D51		+15	5348
D52		-15	5348
D53		+12	5348
D54		-12	5348
D55		+5	5348
D56		-5	5348

KEY

REF	DESIG	FUNCTION	CODE
S1		PAR OFF	630864



RESISTOR

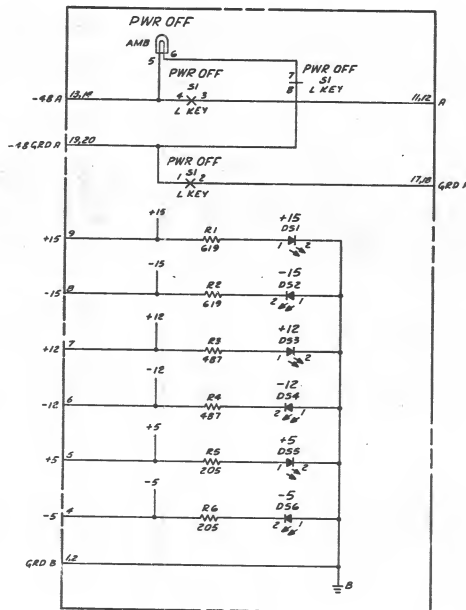
DESIG	CODE
[2] R1, R2	K5-20810, L10, 619
[2] R5, R4	K5-20810, L18, 487
[2] R5, R4	K5-20810, L18, 205

CIRCUIT DESCRIPTION

SEE CO-99392-01

INPUT/OUTPUT INFORMATION

SEE CO-99392-01



MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DIAG	ED-2C595-(1)
CONNECTOR ON FRAME	

SYMBOL
SHOWN IN FIGS

NOTES:

- UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE SHOWN IN OHMS.
INDUCTANCE VALUES ARE IN MICROHENRIES.
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.
- GROUND RETURN.

CPS19
POWER INTERFACE

MINI-ROTL		DWG SIZE	ISSUE
		45	2A
BELL LABORATORIES	SD-99392-01-	J10	

COMPONENT LIST

CONNECTOR

REF DESIG	FUNC DESIG	CODE
J1	TT	KS-21004,L1
J2	CA	KS-21004,L1
J3	TUT	KS-21004,L1
J4	ROTL	KS-21004,L1
J5	105B	KS-21004,L1
J6	105A	KS-21004,L1

CPS 20 PORT TEST ACCESS

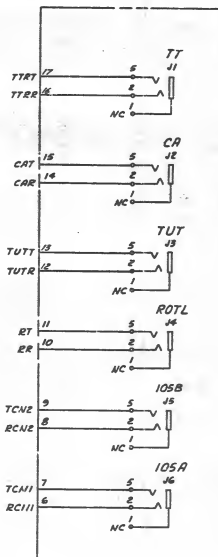
MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	EO-2C554-E)
CONNECTOR ON FRAME	

SYMBOL
SHOWN IN FS

NOTES:

- UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
INDUCTANCE VALUES ARE IN MICROHENRIES,
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.
- GROUND RETURN.



CIRCUIT DESCRIPTION

SEE CO-99392-01

INPUT/OUTPUT INFORMATION

SEE CO-99392-01

CPS20

PORT TEST ACCESS

MINI-ROTL

DWG SIZE
AS

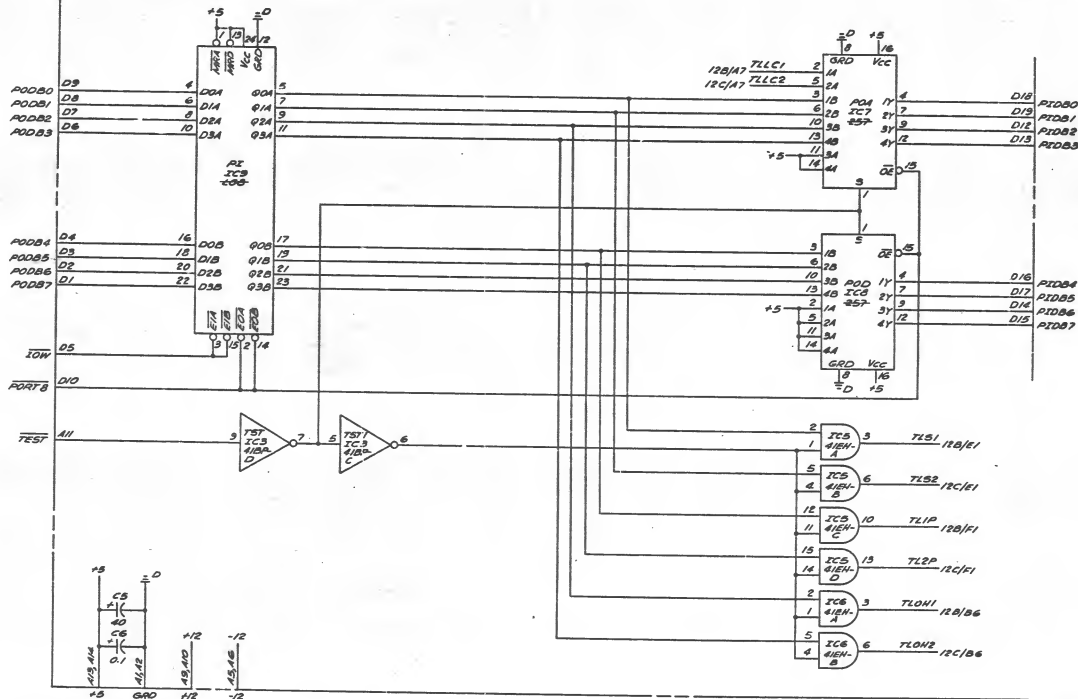
ISSUE
2A

BELL LABORATORIES

SD-99392-01-

J11

PART OF CPS 21
105 TEST LINE LOOP CKT



PART OF CPS 21
105 TEST LINE LOOP CKT

MINI-ROTL

DWG SIZE	
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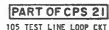
ISSUE

BELL LABORATORIES

SD-99392-01-

J12A

105 TEST LINE LOOP CKT



MINI-ROTL

ONE

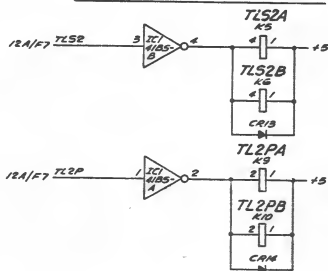
ONG

BELL LABORATORIES

SD-99392-01-

J12B

PART OF CPS 21
105 TEST LINE LOOP SKT

PART OF CPS 21
105 TEST LINE LOOP CKT

MINI-ROT		DWG SIZE	ISSUE
		65	/
BELL LABORATORIES	SD-99392-01-		J12C

PART OF CPS21

125 TEST LINE LOOP SKT

INTEGRATED CIRCUIT

[illegible]

MANUFACTURING REFERENCES

CATEGORY	NO.
CIRCUIT PACK CODE AND ASSEMBLY DRAWING	ED-2C554-()
CONNECTOR ON FRAME	

SYNBO

SHOWN ON SHEET J12F

RELAY

337A	K1	K2	K3	K4	K5	K6
	12B/C2	12C/C2	12B/C2	12B/D1	12C/B2	12C/D1
	12B/C8	12C/C8	12B/E3	12B/E3	12C/D3	12C/E3

VARISTOR

DESIG	CODE
RV1	106A
RV2	106A

345A	K7	K8	K9	K10
4  3	12B/B0	12B/C0	12C/B0	12C/C0
 2	12B/F3	12B/F3	12C/F3	12C/F3

CAPACITOR

DESIG	CODE
C1	S35LY
C2	S35LY
C3	S35LY
C4	S35LY

OPTO-ISOLATOR

DESIG	CODE
U1	4A
U2	4A
U3	4A
U4	4A

RESISTOR

QES16	CODE
R1	K5-20016, L10, 619X
R2	K5-20016, L10, 15K
R3	K5-20016, L10, 15X
R4	K5-20016, L10, 619X
R5	K5-20289, L6C, 75K
R6	K5-20016, L10, 133
R7	K5-20016, L40, 144
R8	K5-20016, L10, 100
R9	K5-20016, L10, 6.34K
R10	K5-20016, L10, 6.34K
R11	K5-20016, L10, 267
R12	K5-20016, L10, 619X
R13	K5-20016, L10, 15K
R14	K5-20016, L10, 15K
R15	K5-20016, L10, 619X
R16	K5-20289, L6C, 75K
R17	K5-20016, L10, 133
R18	K5-20016, L10, 144
R19	K5-20016, L10, 100
R20	K5-20016, L10, 6.34K
R21	K5-20016, L10, 6.34K
R22	K5-20016, L10, 267

CIRCUIT DESCRIPTION

SEE CO-99392-01

INPUT/OUTPUT INFORMATION

SEF 00-99352-01

IC CODE	+5 TERM.	GRD TERM.	
41H	16	8	
41BP	16	8	
41TS	16	7,8	
41EH	16	7,8	
900 KS-21285,16	16	8	
93400 KS-21284,112	24	12	

■ WHEN A BYPASS CAPACITOR IS SPECIFIED ON THE COMPONENT LIST TABLE FOR AN IC, CONNECT BETWEEN THIS TERMINAL AND GROUND AS SHOWN BELOW.

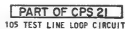


PART OF CBS21

105 TEST LINE LOOP CIRCUIT

MINI-ROT1		DWG SIZE	ISSUE
		65	3B
BELL LABORATORIES	SD-99392-01-	J12D	

SYMBOL



DWG SIZE
65

--	--

SD-99392-01-

E-3484 16-285
PRINTED IN U.S.A.

CMS 3

LOSS AND NOISE MEASUREMENT CIRCUIT

AUXILIARY BOARD NO.1

COMPONENT LIST

INTEGRATED CIRCUIT

DESIG	LOC	CODE
* RMS CONV	D4	BURN-BROWN MODEL 4341 OR EQUIVALENT (SEE NOTE 2)
* SINGLE ELEMENT I.C.		

CAPACITORS

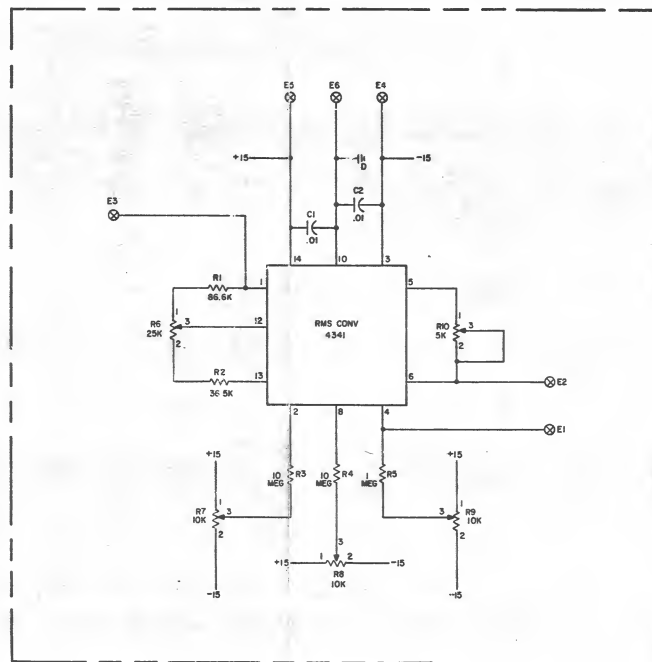
DESIG	LOC	CODE
C1	D4	KS-19774,1E2, 01
C2	C5	

POTENTIOMETERS

DESIG	LOC	CODE
R6	E3	25K
R7	F4	10K
R8	F4	10K
R9	F5	10K
R10	E5	5K

RESISTORS

DESIG	LOC	CODE
R1	D4	KS-2006,11A, 85.6K
R2	E4	36.5K
R3	F4	CC000SF 10 MEG
R4	F4	JULLEN-BRADLEY 10 MEG
R5	F5	KS-2006,11A, 1 MEG



MANUFACTURING REFERENCES

CATEGORY	NO.
CONTROLLING DRAWING	SD-35065-01
CIRCUIT PACK CODE	ED-35132-11
ASSEMBLY DRAWING	

SYMBOL

SEE SD-35065-01-77C.

CIRCUIT DESCRIPTION

SEE CD-35065-DI.

INPUT / OUTPUT INFORMATION

SEE NOTE 30C.

NOTES:

- UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
VALUES PRECEDED BY THE SYMBOL + (PLUS)
OR - (MINUS) ARE IN VOLTS.
- POWER CONNECTIONS FOR THE
INTEGRATED CIRCUITS ARE SHOWN
IN THE POWER DATA TABLE BELOW.

POWER DATA TABLE

IC	GRD TERM	+15 TERM	-15 TERM
RMS-CONV	E6	E5	E4

3. $\frac{1}{2}$ GROUND RETURN.

CMS 3

MINI-ROT

2

SD-99392-01-K1

BELL TELEPHONE LABORATORIES

6S